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SECOND DRAFT  
PROPOSALS BY CANADA

ITU WORLD ADMINISTRATIVE RADIO CONFERENCE (1979)  
FOR THE GENERAL REVISION OF THE RADIO REGULATIONS







11 February, 1978

15

SECOND DRAFT

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## T A B L E O F C O N T E N T S

<u>TITLE</u>	<u>PAGE</u>
General Introduction .....	1
Introduction to Article 1 .....	6
Introduction to Article 5 (10 kHz to 50 MHz) .....	7
Introduction to Article 5 (50 to 960 MHz) .....	12
Introduction to Article 5 (960 MHz to 275 GHz) .....	16
Introduction to Technical Regulations .....	26
Introduction to Articles 9 and 9A .....	31
Introduction to Administrative Regulations .....	33
Proposed changes to Article 1 .....	35
Proposed changes to Article 2 .....	48
Proposed changes to Article 3 .....	69
Proposed changes to Article 5 .....	70
Proposed changes to Article 6 .....	158
Proposed changes to Article 7 .....	159
Proposed changes to Article 8 .....	172
Proposed changes to Article 9 .....	173
Proposed changes to Article 9A .....	181
Proposed changes to Articles 12, 14, 15, 16, 17, 18, 19, 20, 41, 42, 43 .....	192
Proposed changes to Appendix 1, 1A, 1B, 3, 4, 8, 9, XX .....	201
Resolutions A, B .....	221
Recommendations A, B .....	225
Partial Review of Resolutions .....	227
Partial Review of Recommendations .....	233





## SECOND DRAFT PROPOSALS BY CANADA FOR THE 1979 ITU WORLD ADMINISTRATIVE RADIO CONFERENCE

### General Introduction

The second draft Proposals by Canada for the 1979 WARC are substantially more extensive than the first draft issued in February, 1977. Admittedly the first draft did not contain an exhaustive list of proposed revisions, however, there were sufficient proposals for it to be an effective catalyst to initiate submissions from government and non-government members of the Canadian telecommunications community. As a result of the comments received on the first draft, and of the detailed review of the regulations carried out during the past year, it has been possible to make this, the second draft, much more inclusive.

The submissions received have been very useful in achieving the goal of having the proposals reflect the total Canadian needs. A list of those who submitted comments is attached as Annex 1. Indeed, it is recognized that due to the existence of some conflicting needs, it has not been possible to incorporate all of the requirements that have been submitted. However, we believe that adequate, if not ideal, provisions have been made to accommodate most of the Canadian requirements.

It is necessary to keep before us the fact that these revisions relate to the international regulations. Therefore, we have attempted, with few exceptions, to make proposals that would serve the needs of other countries as well as those of Canada. Needless to say, this reality has been a strong influence in the preparation of these proposals.

It should be noted that the technical background for the 1979 WARC will be established by the CCIR at a Special Preparatory Meeting (SPM) in Geneva October 23-November 17, 1978. The Canadian preparations for the SPM are being carried out by the Canadian National Organization for CCIR.

### Agenda for the 1979 WARC

A copy is attached as Annex 2 of the agenda as revised by the 32nd Session of the ITU Administrative Council. The revisions to the agenda have been primarily to define the agenda items more precisely than was done in the earlier version and to include those Articles that deal with a single service but are too brief to be subject of a future Administrative Radio Conference. Note that the numbering of the Articles in the agenda is done in accordance with the rearranged version of the Radio Regulations as well as the numbering system of the 1976 version of the Radio Regulations.

### Future Schedule for Canadian Preparations

While this second draft includes most of the proposals for the 1979 WARC that will be made by Canada, there remain a few areas that

have not yet been examined. Therefore, in July of this year, it is intended to issue a supplement to the second draft to cover the remaining regulations and agenda items not covered in this document.

During the last quarter of 1978 the final draft of the proposals will be prepared based on the second draft and supplement, a further review of the regulations, and the comments that have been submitted. Then, in accordance with the ITU Convention, the proposals for the 1979 WARC will be submitted to the ITU in January, 1979.

In order to meet this schedule, it will be necessary to receive submissions containing comments on the second draft and on the supplement on or before May 31 and August 31 respectively.



LIST OF ORIGINATORS OF COMMENTS ON THE  
CANADIAN FIRST DRAFT PROPOSALS AND OF  
THOSE WHO MADE SUGGESTIONS FOR SECOND DRAFT

British Columbia Telephone Company  
The Canadian Amateur Radio Federation  
Canadian Association of Broadcasters  
Canadian Broadcasting Corporation  
Canadian Electrical Association  
Canadian International Development Agency  
Canadian National Telecommunications  
The Canadian Radio Relay League  
Canadian Radio Technical Planning Board  
Canadian Radio-television and Telecommunication Commission  
Canadian Telecommunications Carriers Association  
Department of Energy, Mines and Resources  
Environment Canada  
Health and Welfare Canada  
International Microwave Power Institute  
Mr. Neil Johnson  
Marinav Corporation  
Department of National Defence  
National Research Council  
Ontario DX Association  
Ontario Hydro  
The Railway Association of Canada  
Switzer Engineering Services Limited  
Teleglobe Canada  
Telesat Canada  
Transport Canada

Copies of these comments are available for inspection at the Regional  
Offices of the Department of Communications.

R No. 801 WORLD ADMINISTRATIVE RADIO CONFERENCE, 1979

The Administrative Council

in view of the result of the consultations following Circular-  
telegrams Nos. A 72 dated 18 June 1976 and A 125 dated 27 May 1977,

resolves

1. that the Conference shall be convened in Geneva on 24 September 1979 for a duration of ten weeks;
2. that the agenda of the Conference shall be as follows :
  - 2.1 to review and, where necessary, revise the provisions of the Radio Regulations relating to terminology, the allocation of frequency bands and the directly associated regulations (Articles of the Re-arrangement of the RR : N1, N2, N3, N5, N6, N7, N8, N25, N26, N27, N28 (Section I), N29, N33 (Section IV.B) and N47 and related Appendices not applying to a single service);  
(Articles of the 1976 edition of the RR : 1 to 6 and Sections I, II, III, VI, VII, VIII and IX of Article 7)
  - 2.2 to review and, where necessary, revise the provisions applicable to the coordination, notification and recording of frequency assignments except those Articles relating to a single service (Articles of the Re-arrangement of the RR : N11, N12 and N13 and related Appendices, but not Articles N14 and N15);  
(Articles of the 1976 edition of the RR : 9 and 9A but not 9B and 10)
  - 2.3 to review and, where necessary, revise the other Articles applicable to more than one service (Articles of the Re-arrangement of the RR : N4, N16 to N24 and related Appendices not applying to a single service) and provisions applicable to miscellaneous stations and services (Articles of the Re-arrangement of the RR : N30, N31, N32, N33 (Sections I, II, III and IV.A) and N39 and related Appendices);  
(Articles of the 1976 edition of the RR : 12 to 20; 41 to 44)
  - 2.4 to make any necessary consequential editorial amendments to other provisions of the Radio Regulations and the Additional Radio Regulations resulting from the action taken under agenda items 2.1, 2.2 and 2.3;
  - 2.5 to review the report on the activity of the IFRB and revise, where necessary, the provisions relating to its methods of work and internal regulations (Articles of the Re-arrangement of the RR : N9 and N10);  
(Articles of the 1976 edition of the RR : 8 and 11)
  - 2.6 to study the technical aspects for the use of radiocommunications for marking, identifying, locating and communicating with the means of medical transport protected under the 1949 Geneva Conventions and any additional instruments of these Conventions;



- 2.7 to take account of Resolution No. Sat-10 of the World Broadcasting-Satellite Administrative Radio Conference, Geneva, 1977, on the possible re-arrangement of the Radio Regulations and Additional Radio Regulations, to make such consequential changes as may be necessary to harmonize the Radio Regulations as well as the Additional Radio Regulations and to undertake any further necessary refinement and deletion of superfluous or redundant provisions;
- 2.8 to consider the proposals based on the CCITT studies carried out in accordance with Resolutions Nos. Mar2-22 and 23 and to take appropriate decisions;
- 2.9 to consider the resolutions and the recommendations adopted by administrative radio conferences, to take such action as may be considered necessary and to adopt such new resolutions and recommendations as may be necessary;
- 2.10 to propose to the Administrative Council and to the next Plenipotentiary Conference a programme for convening future administrative radio conferences to deal with specific services;
- 2.11 to provide, for the benefit of future administrative radio conferences, such guidelines as may be found necessary for optimum use of the frequency spectrum.

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This Resolution replaces Resolution No. 783.

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Ref. : Doc. No. 5151/CA32 (1977)

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## INTRODUCTION TO ARTICLE 1

### TERMS AND DEFINITIONS

1. Provision has been made for active and passive remote sensing operations in the Earth-Exploration Satellite and Earth Exploration Services (terrestrial) in order to outline the basic purposes for this new generation of remote sensing operations.
2. A definition of an Auxiliary-Satellite Service is proposed and this service is to be used by low capacity systems and is intended to improve orbital and spectrum efficiency. See the discussion under Article 5 for more details on this new service.
3. The term "Transportable Earth Station" has been added to the definitions since this type of station is proposed for inclusion in the Radio Regulations.
4. Based upon comments received, some of the existing terms and definitions have been slightly revised to clarify or improve the subject matter. A request to include a definition for Power Line Carrier was considered but was found unnecessary since this type of operation is not referred to in the Radio Regulations and since any frequencies assigned for this type of operation fall under domestic rather than international regulations. There were opinions expressed that a definition for the Power Line Carriers would probably not be accepted internationally and that suitable national policies can accommodate this type of service.
5. The addition of vehicle location and control systems within the definition of the land mobile service as outlined in the first draft was deleted since it was considered that the present definition did not exclude such operations and revising the current definition would only introduce complications.
6. Consideration is being given to defining a new term, "In-orbit spare satellite", as a result of the use of this new term in our proposals.



## INTRODUCTION TO ARTICLE 5

### THE PROPOSED ALLOCATIONS BETWEEN 10 kHz AND 50 MHz

#### 1. Introduction

Since the distribution of the first draft of the Proposals by Canada in February 1977, a number of the submissions listed as Annex 1 to the general introduction contain comments that are relevant to this frequency range. All of these comments have been considered and, to the extent possible, they have been incorporated into the second draft.

The general principles for the revision of this frequency range that were outlined in the first draft have been maintained.

#### 2. Aeronautical Mobile Service

Pending the decisions of the 1978 WARC for the revision of the frequency allotment plan for the Aeronautical Mobile (R) Service, no changes have been proposed to the frequency bands allocated to this service. However, recognizing that the frequency allotment plan for the Aeronautical Mobile (OR) Service, Appendix 26, has not been revised since 1959 and that there are many countries that do not have allotments in the current plan, there are proposals for a moderate expansion of some of the (OR) bands. In this manner provision is being made for the revision of Appendix 26 which will likely be undertaken in the 1980's.

#### 3. Aeronautical Radionavigation Service

It was proposed in the first draft to provide additional spectrum for aeronautical radiobeacons by allocating the 415-495 kHz band, on a secondary basis, to the Aeronautical Radionavigation Service. On further examination it was concluded that even though the major need was for aeronautical radiobeacons in inland areas, and the Mackenzie Valley was cited as an example, due to the high probability for long distance propagation at these frequencies, sharing with the Maritime Mobile Service is now not considered feasible. Therefore, in the second draft, in the 415-495 kHz band, there is a proposal for two exclusive allocations - one to each of these two services. Additionally, the band 190-200 kHz, which is covered by the frequency range of the existing airborne receivers and is immediately adjacent to the current allocation to the Aeronautical Radionavigation Service at 200-285 kHz, is being reallocated primarily for aeronautical radiobeacons on oil exploration platforms operating in the coastal areas and in remote areas of Canada.

#### 4. Amateur Satellite Service

It was noted in the first draft that the requirement foreseen for the allocation to the Amateur Satellite Service at 7 and 14 MHz had not materialized, therefore, this service was suppressed. However, as requested by the amateur community, this proposal is not included in the second draft.

#### 5. Amateur Service

Despite the substantial support from the amateur community for an allocation to the Amateur Service in the band below 200 kHz, due to the pressing needs of the Fixed and Radionavigation Services in that part of the radio spectrum it has not been possible to make such a change.

The proposals in the first draft for the band 1605-2000 kHz have been reviewed and changed completely. Due to the phasing out of most of the Loran-A radionavigation systems and with the only continuation of Loran-A limited to 1950 kHz, it is proposed to retain only the band 1900-2000 kHz exclusively for Loran-A and other radiodetermination systems that will be operating below 2 MHz. It is then possible to propose an exclusive amateur band at 1800-1900 kHz. Due to the diminishing use by fixed and mobile systems of the band under 2 MHz, it is proposed to retain the 1705-1800 kHz band for these services and to reallocate the 1605-1705 band to the Broadcasting Service. Also, as indicated in the note under the table, the upper limit may be moved up to 1750 kHz.

The comments from the amateur community with respect to the proposals for changing the allocations in the 3500-4000 kHz band have been reviewed carefully. It is still concluded that the proposals in the first draft are the only way to accommodate the very real needs for expanding the Fixed, Maritime Mobile and Broadcasting Services in the vicinity of 4 MHz. While it was recognized that this change would put some constraint on the amateur operations, it was felt that the changes at 7 and 10 MHz, which were supported by the amateur comments, would open new opportunities for the radio amateurs and offset the reduction in the 3.5-4 MHz band.

As noted below under the section on the Fixed Service, it has been necessary to restore some of the Fixed Service allocations that were reallocated to other services in the first draft. For this reason two such proposals for the Amateur Service have been reviewed and it has been found necessary to reduce the bandwidth by 100 kHz of the new amateur band proposed near 10 MHz (now 10.1-10.3 MHz) and to delete the proposal for a new Amateur band near 18 MHz. While the deletion of the



proposed amateur band at 18 MHz was to provide for the continuing needs for the Fixed Service in that band, it was noted that the amateur community in their submissions did not offer support for the retention of this proposal. With regard to the proposed amateur band at 10.1-10.3 MHz, there is concern that problems will arise because of the proximity to the IF frequency of domestic FM receivers at 10.7 MHz. Laboratory tests are underway to evaluate this problem and comments are invited from interested parties.

## 6. Broadcasting Service

There was limited support from the broadcasting community for an allocation to the Broadcasting Service in the band 115-190 kHz. However, as noted above, due to the pressing needs of the Fixed and Radio-navigation Services in that part of the radio spectrum it has not been possible to make such a change.

It is well known that the present AM band, 535-1605 kHz, is extensively and efficiently used in Canada. Indeed, currently there are only a very limited number of restricted channels available for future expansion. Therefore, noting the diminishing use by the fixed and mobile services of the adjacent band above 1605 kHz, it was concluded that the reallocation to the Broadcasting Service of the band 1605-1705 kHz would be appropriate. As noted under this band in the proposed table of frequency allocations, spectrum available for the Broadcasting Service will continue to be reviewed and depending on the continuing needs of the Fixed and Mobile Services and the proposals for use from the broadcasting community, this proposal may be altered prior to 1979.

The proposals to expand the HF broadcasting bands have been altered only slightly from those contained in the first draft. It should be pointed out that at this time there appears to be widespread international support for the expansion of the allocations to the Broadcasting Service. Also, it is anticipated that there will be less out-of-band operation by this service if the allocated bands are expanded.

In order to make more efficient use of the bands allocated to the HF Broadcasting Service, proposals have been made under Article 7 to limit the maximum transmitter power and the number of channels carrying the same program simultaneously, and to adopt single sideband mode of emission as soon as possible.

7. Fixed Service

As noted above, during the review of the first draft, and in the light of the new requirements, it has been necessary to delete or reduce some of the proposals to reallocate portions of the fixed bands. It is anticipated that the current proposals for the Fixed Service are entirely adequate to provide for the future needs of this service.

It should be noted that there is a new footnote to provide some protection for Loran-C by restricting the use of the 80-90 kHz and 110-120 kHz bands, however, this should not affect the Fixed Service except in coastal areas and the area around the Great Lakes.

There was a comment objecting to the suppression of footnote 202 in the band 5005-5060 kHz because it may lead to broadcast interference to individual fixed assignments in that band. It is not expected that this interference will arise because any use of the band by broadcasting stations will of course be coordinated with the existing assignments.

8. Maritime Mobile Service

Due to the diminishing use of radiotelegraphy in the lower part of the MF band it seemed reasonable to reallocate the 415-435 kHz band to the Aeronautical Radionavigation Service. Except for this change and a small alteration to the proposal near 16 MHz, the proposals for this service are similar to those contained in the first draft.

It should be noted that there is a new footnote to provide some protection for Loran-C by restricting the use of the 80-90 kHz and 110-120 kHz bands, however, this should not seriously affect the Maritime Mobile Service.

9. Radio Astronomy Service

The proposal in the first draft to allocate 100 kHz near 13-14 MHz to the Radio Astronomy Service has been reviewed and it is concluded that the proposal will be retained. In addition, after reviewing the proposal in the first draft for the allocation to Radio Astronomy near 23 MHz, it has not been deemed necessary to alter this proposal.

10. Radiodetermination Service  
(Radiolocation and Radionavigation)

There are only minor changes to the proposals in the first draft



for the Radiodetermination Services. As noted above, the proposal for exclusive Radionavigation from 90-110 kHz has been retained and in response to some recent frequency coordination problems, it has been found necessary to propose footnote 166A to give additional protection to Loran-C radionavigation systems.

As noted above, the proposals for the band 1605-2000 kHz have been reviewed and it has been decided to allocate the 1900-2000 kHz band to the Radiodetermination Service **exclusively**. It is expected that in the future there will be continued operation of Loran-A on 1950 kHz and also there are a number of radiodetermination systems that will be operating in this band.

11. Standard Frequency and Time Service

The proposal in the first draft to allocate 7330-7340 kHz to the Standard Frequency Service has been reviewed and due to the need to increase the allocation to the Broadcasting Service up to 7.4 MHz, it has been decided that the provision for CHU on 7335 kHz will be by means of a footnote rather than a primary allocation.

THE PROPOSED ALLOCATIONS BETWEEN 50 MHz AND 960 MHz

A. Frequency Bands between 50 MHz and 406 MHz

Since the distribution of the first draft Canadian proposals in February 1977, submissions relevant to this frequency band have been received from Canadian National Telecommunications, Marinav. Corporation, the Canadian Radio Technical Planning Board (CRTPB), Land, Fixed and Mobile Committee and the Canadian Amateur Radio Federation. All of these comments have been considered as reflected below.

1. Aeronautical Mobile Service

The CRTPB had proposed that the current Table of Allocations be retained and that Aeronautical Mobile (R) not be added in the band 136-138 MHz. This proposal has been reviewed and the need to accommodate critical shortages of VHF aeronautical mobile (R) channels for air traffic control purposes has been confirmed. The first draft proposal for the band 136-138 MHz therefore appears unchanged in the second draft.

2. Aeronautical Mobile-Satellite Service

An allocation by footnote 315D gives aeronautical mobile-satellite service secondary status in the bands 405.5-406 and 406.1-410 MHz. This footnote allows a mobile satellite the flexibility of accommodating possible Aeronautical Mobile Satellite Service requirements and, in the latter band, operations are restricted to geographical areas remote from all Radio astronomy observations.

3. Amateur Service

The Canadian Amateur Radio Federation requested that footnote 320A be added to the amateur bands 50-54 MHz, 144-146 MHz and 146-148 MHz. Since an amateur satellite allocation is already in the band 144-146 MHz it would be inappropriate to add a footnote covering the same service therefore no change has been proposed for this band. In the bands 50-54 MHz and 146-148 MHz the amateur service in Region 1 is shared with other services. Unless the amateur community can provide a means of protecting these shared services, it will not be possible to allocate these bands to the Amateur-Satellite Service.

#### 4. Earth Exploration-Satellite (Earth-to-Space)

It was proposed in the first draft that the allocation of Earth Exploration-Satellite Service in the band 401-403 MHz would include those operations performed by the Meteorological-Satellite Service. This proposal is modified in the second draft, to permit the continued primary operations of the Meteorological Aids Service, by proposing Earth Exploration-Satellite (Earth-to-Space) as secondary rather than primary status.

#### 5. Fixed Service

Canadian National Telecommunications requested that Fixed Service be protected, for a period of time beyond 1979, in the band 73-74.6 MHz. Footnote 253A has been modified in the second draft to permit fixed, mobile and broadcasting service operations previously authorized in this band to operate until December 31, 1985 on a non-interference basis to the Radio Astronomy Service.

#### 6. Mobile-Satellite Service

As a result of further studies of the first draft proposal to add mobile satellite in the band 403-410 MHz, potential difficulties in sharing between the Meteorological Aids and Mobile-Satellite Service in 403-406 MHz were identified. It has been decided therefore, in the second draft, to remove the proposed mobile-satellite allocation in 403-406 MHz but to introduce a footnote 315E allocating the band 405.5-406 MHz on a primary basis to the Mobile-Satellite Service (Earth-to-Space). It should be noted that the proposed fixed and mobile alloca-



tions in 403-406 MHz have returned to their initial secondary status as a result of these same studies.

#### 7. Radiolocation Service

The comments of Marinav Corporation were noted concerning the present day derivations of SHORAN using frequencies in the bands between 174-335.4 MHz (typically 235, 250 and 300 MHz). Marinav mentioned that these systems are being phased out in favour of new systems using the 420-450 MHz band and that survey interests would not appear to be adversely affected if this band were to be denied to radiodetermination systems after WARC 1979. In light of this comment, this proposal in the first draft has been retained. However, the allocation of frequency spectrum for radiolocation is still under review in the bands between 406-960 MHz.

#### B. Frequency Bands between 406 and 960 MHz.

The Department, on December 17th, 1977, gave notification in the Canada Gazette of the availability of a discussion paper on a proposed policy for the 406-960 MHz band. A period of 90 days has been allowed for interested parties to provide the Department with submissions on this matter. The National policies for this portion of the UHF spectrum will be reflected in the Canadian proposals to the 1979 WARC and are compatible with the proposed domestic policy, however, these proposals are subject to change depending on the final outcome of the domestic policy referred to above.

Certain proposals have been made to the Department which have not been fully addressed in the 406-960 MHz discussion paper. These include, in general, the allocations for the fixed service. In addition, it should be specifically noted that Transport Canada has proposed, by footnote, two Maritime Mobile 2 - MHz "slots" in the area

410-430 MHz, spaced 5 or 10 MHz apart. Action on this proposal is dependent not only on the final domestic allocation policy, but also on sub-allocation decisions to be taken subsequent to the release of the final policy. The CBC has also proposed the continuation, on a primary basis of STLs (Studio Transmitter Links), in the two sub-bands 450.0-451.0 MHz and 455.0-456.0 MHz and the addition of Remote Pickups for broadcast use in these bands. The Corporation has also proposed the high quality audio STLs in the sub-band 956-960 MHz be given primary status. These proposals are now under review within the Department.

THE PROPOSED ALLOCATIONS BETWEEN 960 MHz AND 275 GHz

1. Aeronautical and Maritime Mobile Services

In the bands above 43 GHz which are now allocated to the Aeronautical Mobile-Satellite, the Maritime Mobile-Satellite, the Aeronautical Radionavigation-Satellite and the Maritime Radionavigation-Satellite services, the terrestrial counterparts of these space services have been proposed in accordance with Recommendation Spa 2.4 of 1971 WARC. While the actual means of technical sharing of these bands by many space and terrestrial services has not been addressed in these proposals, the essential intent is to make these bands available for future terrestrial and space experimentations and applications in accordance with the most up-to-date sharing criteria available.

In several bands allocated to the Mobile Service, the words "except aeronautical mobile" have been inserted in order to protect earth based passive services from in-band interference which could emanate from air-borne transmissions.

2. Aeronautical Mobile-Satellite and Maritime Mobile-Satellite Services

Additional spectrum for the ~~Maritime Mobile-Satellite Service~~ is being proposed in the area 1535-1660 MHz as well as an increase in the bands allocated on a shared basis to the ~~Maritime-Mobile Satellite~~ and the ~~Aeronautical Mobile-Satellite Services~~. A space-to-earth band has been provided at 1624-1625 MHz for the development of emergency position-indicating radio beacon systems using space techniques. These additional spectrum requirements have necessitated a reduction to the Aeronautical Radionavigation ~~Service~~ allocation at 1558.5-1636.5 MHz.

3. Mobile-Satellite Service

With the exception of systems operating in parts of the band from 240 MHz to 399.9 MHz under the provisions of footnote 308A, indications are at this point in time that ~~Maritime Mobile-Satellite~~ systems operating in parts of the 1535-1660 MHz band may be the only types of widely deployed installations suitable for use with mobile earth stations. Consequently a new footnote ADD 351A has been proposed to provide for an increased operational flexibility in the use of maritime



mobile-satellite systems taking into account that this increased flexibility is particularly desirable in the remote areas of the world where space techniques offer a viable solution to numerous social needs. It is to be noted that the recommendation of the CRTPB concerning the deletion of the band 1435-1525 MHz as originally proposed in the First Draft for Mobile-satellite has been accepted and this band no longer appears in the new ADD 351A.

An allocation to the **Mobile-Satellite Services** has been proposed in the bands 7250-7300 MHz and 7975-8025 MHz in order to provide for the special requirements of space systems operating in these bands.

4. Amateur Services

In response to the Canadian amateur community, new amateur allocations above 1 GHz were included in the First Canadian Draft. However, since the publication of the First Draft, many new requirements for other services in the bands above 40 GHz have emerged and consequently, some readjustments to the amateur proposals were necessary, particularly in the 50 GHz, 75 GHz, 160 GHz and 250 GHz bands. The comments from the amateurs that space operations should be allowed in all bands allocated exclusively to **the terrestrial amateur service** has been taken into account and this approach is reflected in these proposals. The modifications proposed in the First Draft to 320A have been expanded to include the band 240-250 GHz.

5. Fixed-Satellite Service

The proposed allocations for the Fixed-Satellite **S**ervice have taken into account both the Canadian and **i**nternational requirements and the reasons for these proposals are outlined within the revised Table. However, it might be useful to indicate here further reasoning underlying the proposals for the following bands:

4400-4700 MHz	The international requirements (ie INTELSAT) supported by Teleglobe, call for down-link operations while the Canadian requirements indicate the need for up-links which might be considered for use for feeds to broadcasting satellite space stations.
---------------	---

10.7-17.7 GHz      There is an international requirement to expand space -  
to-earth operations within the full 10.7-11.7 GHz con-  
tiguous band. There is also a foreseeable Canadian  
need for fixed-satellite down-links in this band and  
consequently there is a total requirement for 1500  
MHz earth to space allocation in the 12.5-11.7 GHz  
range to complement the expanded down-link require-  
ments between 10.7 GHz and 12.5 GHz. These require-  
ments are reflected in our proposals.

As per the recommendation of the CRTPB, footnote 392A dealing  
with the band 6625-7125 MHz has been suppressed. Footnote 392D per-  
taining to the operations of passive fixed-satellite systems in the  
band 7250-7750 has also been suppressed on the grounds that systems  
of this type appear to be no longer required and further, that such  
systems possess technical characteristics which hinder the efficient  
use of radio frequency and orbit resources.

The allocations in the 2500-2535 MHz and 2655-2690 MHz bands  
to the Fixed-Satellite Service have been deleted because of the compara-  
bility narrow bandwidths involved and these bands have now been pro-  
posed for allocation to the Auxiliary-Satellite Service.

The comments of the CTCA re suggested allocations to the Fixed-  
Satellite Service in the range 31.8-300 GHz were taken into account  
and coordinated with Teleglobe and Telesat.

In general, sharing between the Fixed, Fixed-Satellite, and  
Mobile Services is shown for all frequencies allocated to these ser-  
vices above 38.5 GHz. The reason for showing these bands as shared  
is that we are unable at this time to accurately identify the future  
requirements of the individual services or to determine which bands  
would best meet their needs from a technical point of view. Thus by  
showing sharing for these services, the freedom is left for the bands  
to be utilized as actual needs arise in the future and as technological  
developments encourage use in specific bands.

6. Auxiliary-Satellite Service

This new proposed type of service (refer ADD 84AGE under Section IIA of Article I) would serve to provide entry and exit

links for connection between earth stations at fixed points and space stations operating in services which require relatively small bandwidths such as the Mobile-Satellite Service for example. Bands for this new service have been proposed at 2.5 GHz, 3 GHz and 6 GHz noting that the allocations in these two latter bands have been placed adjacent to bands allocated to the Fixed-Satellite Service for purposes of operational flexibility. In addition, the proposed modification to footnote 383B will also provide for such type of service when associated with operations of the Aeronautical Mobile (R) Service and/or the Radiodetermination Service.





7. Inter-Satellite Service

The choice for the new proposed bands for this service was governed by the absorption characteristics of certain bands above 20 GHz which will provide natural isolation between the inter-satellite and terrestrial services operating in the same bands. In some cases, it was found necessary to avoid bands which would have been suitable for the purpose but could not be employed because of existing operations by other services.

The suggestions by CTCA regarding the allocations to this service in the frequency range from 31.8-300 GHz were taken into account.

8. Radionavigation Service and Radiolocation Service

The increase in maritime and aeronautical traffic warrants the expansion of the bands which are used for radionavigational aids associated with the safety-of-life in the air and on the seas. Consequently, the recommendations of Transport Canada have been taken into account as well as the recommendations of the Department of National Defense which also has an interest in these types of operations.

The following bands have been proposed for the purpose noting that many of these proposals are similar to that outlined in the First Draft:

- 2300-2350 MHz - Add Maritime Radionavigation (shore-based radars)
- 3100-3300 MHz - Add Radionavigation (as per First Draft)
- 8850-9000 MHz - Add Maritime Radionavigation
- 9200-9300 MHz - Add Maritime Radionavigation
- 9500-9800 MHz - Add Radionavigation

Several footnotes applicable to these services have been added or existing ones modified in order to ensure operational flexibility and/or technical compatability as required in particular bands.

The comments of the CRTPB suggesting the deletion of Radiolocation from the band 3500-3700 MHz have been taken into account but the only action deemed feasible at this time has been to propose a change in the service category of radiolocation from primary to secondary.

The suggestion of MARINAV to change the existing allocation in the 9300-9500 MHz bands from Radionavigation to Radiodetermination in order to allow the use of transponder-type survey systems is still under consideration and the merit of this suggestion is acknowledged.

9. Earth Exploration Services

With reference to the Terms and Definitions under Article 1, it will be noted that many new terrestrial and space services have been proposed in order to outline the basic purposes of this new generation of active and passive sensor operations and to provide

spectrum for such applications. Many bands have been proposed either by footnotes (see ADD 345A and ADD 393A), by sharing with Radio Astronomy in the bands 1400-1427 MHz and 10.6-10.7 GHz, or by sharing with other services as deemed appropriate or by the allocation of exclusive bands for the purpose. The bands involved are the following:

1215-1300 MHz, 3100-3300 MHz, 8550-8650 MHz, 13.4-14.0 GHz, 1400-1427 MHz, 2690-2700 MHz, 6625-7250 MHz, 10.6-10.7 GHz, 15.35-15.45GHz, 17.7-17.9 GHz, 19.7-19.9 GHz, 22.21-22.5 GHz, 23.6-24 GHz, 31.3-31.5 GHz, 34.2-35.2 GHz, 50-59 GHz, 71-73 GHz, 100-102 GHz and 182-185 GHz.

The choice of the bands mentioned above was governed primarily by the underlying physical process associated with the properties of the earth and of its atmosphere and the specific information which is being sought. In the case of passive sensors,



many bands are required in order to estimate the separate radiant sources where the individual spectra are broad and overlapping. It is recognized that sharing difficulties may arise in those cases where other services utilize identical bands; however, these sharing issues are being studied within the CCIR.

10. Radio Astronomy Service

The concern expressed by the CRTPB regarding the proposed change to the wording of various footnotes in order to enhance the protection to radio astronomy in the case involving the sharing of certain bands has been noted. However, in view of the fact that there are only two major radio astronomy sites in Canada, it was considered that any coordination problems could be resolved without undue difficulties.

The suppression of Radio Astronomy in the band 2690-2700 MHz and the addition of this service in the band 3325-3360 MHz, as proposed in the First Draft, has been retained. Again, while CRTPB did not favour the allocation to this service between 4950-4990 MHz, this proposal was retained for the reasons given above.

A new proposal has been made at 15.4-15.45 GHz replacing the proposal at 14.45-14.65 GHz which appeared in the First Draft. Passive sensor operations have also been proposed at 15.4-15.45 GHz because of the similar interference protection required by radio astronomy and passive sensors operations.

The allocation at 36.5-37.5 GHz proposed in the First Draft has been retained as well as the proposed allocations above 40 GHz.

11. Broadcasting-Satellite Service

The suggestion of the CRTPB to delete all terrestrial services in the band 11.7-12.2 GHz was acted upon accordingly. However, the suggestion to delete Broadcasting (terrestrial) from the 12.2-12.5 GHz band was not considered appropriate at this time.

Insofar as the 12.2-12.5 GHz band is concerned, it appears that any requirements for services in this band are essentially long-term. Therefore, in order to make it possible to provide for the potential needs of the Broadcasting-Satellite Service and in order to provide some flexibility for the 1982 Broadcasting-Satellite Planning Conference (Region 2), an allocation for broadcasting-satellite has been proposed in this band. The existing allocations to other services in this band have been retained since it is not deemed possible at this point in time to foresee what the long-term needs actually are and the associated relative priorities which may need to be assigned for a particular service or services. This proposed action would provide flexibility for the use of this band and allow for the development of domestic policies as national requirements and priorities evolve. The sharing of the band 12.2-12.5 GHz by the services allocated within this band is an item which is being examined further.

A somewhat similar situation applies in the frequency range 2500-2690 MHz in the sense that the planning for the domestic use of this band by the Broadcasting-Satellite Service and the other services which share these same bands, is a matter which requires further consideration. Consequently, the only changes made to these bands have been those involving the Fixed-Satellite and the Auxiliary-Satellite Service as mentioned elsewhere in this preamble.

One important consideration which has still to be resolved is the matter of sufficient spectrum and appropriate bands for earth-to-space feeder link to broadcasting-satellite space stations. While the 4400-4700 MHz band may be suitable for this application, other bands may have to be considered, depending on the amount of spectrum found necessary. Further, it has been suggested that certain frequency bands allocated to the Fixed-Satellite Service be designated for up-links for use by Broadcasting Satellites.

## 12. Fixed and Mobile Services

It will be noted that the expansion of the Fixed-Satellite Service in bands now allocated to the Fixed and Mobile Services

will in some cases require the application of coordination procedures which were not heretofore necessary; however, this procedure has not, to our knowledge, placed undue constraints on terrestrial systems in the past.

The proposals for these services are relatively few in the bands below 40 GHz, ie: Fixed in the band 1435-1525 MHz is now primary category and, as mentioned elsewhere, Fixed has been deleted from the 11.7-12.2 GHz band. However, many proposed allocations for the Fixed and Mobile service have been made in the bands above 40 GHz and, in the majority of cases, these allocations are on a shared-basis with the Fixed-Satellite or the Inter-Satellite Service for ease of coordination. Many of these proposals reflect the suggestions of CTCA.

The recommendation of the CRTPB to add Fixed and Mobile in Region 2 in the band 1350-1400 MHz was not acted upon because of lack of justification for such requirements as well as the interference problems that would result from the operation of radiolocation installations.

The recommendation of the CRTPB to lower the category of fixed in the 14.4-14.5 GHz band is still to be acted upon.

The suggestion of CTCA for the addition of Fixed and Mobile in the area of 140 GHz is still to be acted upon.



INTRODUCTION TO THE TECHNICAL REGULATIONS

The proposals for the Technical Regulations are based on a compromise between equipment cost and system efficiency and performance and spectrum utilization efficiency.

1. The new technical definitions proposed for Article 1 are for terms used frequently in the Radio Regulations. The modifications to existing definitions and the introduction of new definitions are intended to take account of advances in technology since the last Administrative Radio Conference.

2. Proposals have been made to certain provisions of the Radio Regulations where the term "harmful interference" is employed. These proposals are to differentiate between this term and the new term "permissible interference" proposed under ADD 92D and to bring the meaning of these provisions in their proper context.

3. Extensive changes have been proposed to Article 2. These proposals which deal with the method of designating emission and necessary bandwidth, take account of known national opinion on the matter and the rather firm desire of the international community that the existing system be improved. It is considered that the use of the letters H, K, M and G (for Hz, kHz, MHz and GHz) ensure readability and permit the standardization of the quantity of characters (four). This is considered to be a necessity as increasing use is made of computers in frequency management. The emission designators are a modification of CCIR Recommendation AB-1. In our proposal, three characters are used, and multiplexing information has been included. Comments are invited, particularly with regard to the need for the inclusion of multiplexing information in the designator, the system proposed for indicating this information, and the use of alphabetic indicators versus the current alpha-numeric configuration. CCIR is continuing the study of this item and further revision may be made in the light of the CCIR work.

4. Proposals for Articles 7, 12 and 14 are based upon known and foreseen needs in various services. Additional information and comments are welcome.

5. The Table of Frequency Tolerances, Appendix 3, was examined with

respect to spectrum efficiency taking into account existing and proposed DOC specifications as well as appropriate CCIR documents. This examination included various terrestrial systems as well as space systems. The proposals on the former are incorporated in Appendix 3.

6. With regard to space systems, the following frequency tolerance limits were considered for earth stations and space stations:

- a) 2.45-10.5 GHz; 5ppm for transmitters used until January 1987, and 3 ppm for new transmitters after January 1985.
- b) 10.5-40 GHz; 10 ppm for transmitters used until January 1987 and 7 ppm for new transmitters after January 1985.

Some people active in this field expressed the view that, although these limits could be met with current technology, space stations should be exempted because of long-term frequency drift resulting from oscillator aging.

7. Furthermore, operating agencies consider that the long-term space station frequency tolerances of 10 ppm is the maximum acceptable limit for communications carriers. For the telemetry and tracking frequencies, however, a limit of 15 ppm seems more suitable. However, operators suggest that both space stations and earth stations should continue to be omitted from Appendix 3 in view of the general practice of coordinating on a band basis and of the use on most large frequency carriers, of an energy dispersal frequency variation which overwhelms any long-term carrier drift.

8. Also it should be noted that some ambiguity could exist in the application of Appendix 3 to space stations which use simple frequency translation techniques. The total frequency tolerance of a carrier transmitted by a space station is a function of the earth station carrier tolerance as well as of the inherent space station tolerance. Appendix 3 provides limits for individual components rather than for a system, and the total tolerance of a carrier transmitted by a space station will be larger than the tolerance of the space station itself. Various frequency error cancellation schemes have been used in an effort to remove the effects of these frequency translation errors.

9. Thus it has been concluded from the above that we are not in a position at this time to propose the addition to Appendix 3 of frequency tolerances for earth stations or space stations since there would not appear to be significant advantage to be obtained.
10. The review of Appendix 4, Table of Tolerances for Levels of Spurious Emissions, was based on the considerations used in reviewing Appendix 3.
11. The proposed levels of spurious emissions were deemed reasonable according to comments received from some sources, although it was indicated that the term "spurious emissions" should only refer to energy which falls outside the allocated band. From an interference point of view, the in-band wanted signal is the controlling factor rather than the low level spurious signal. Further, it was noted that it is more meaningful to specify spurious emissions as radiated levels and to indicate the bandwidth of the spurious emission.
12. Some people stated that the application of the proposed limits to spurious emissions within the allocated band would force channelization of ground stations with resultant filtering at a cost in transmitter power and frequency agility. They also noted that, in specifying the levels of spurious emissions, reference should be made to the output power of each space station channel rather than to that of a carrier which can change drastically according to the traffic.
13. The practicality of extending the frequency range of Appendix 4 to include that used by earth stations and space stations was questioned.
14. From the above comments, it was concluded that limits on spurious emissions should only apply to frequencies outside the allocated band and not to frequencies within the allocated band but outside the necessary bandwidth. While it does not seem possible at this time to recommend specific limits of spurious emissions at out-of-allocated-band frequencies, the specification of a maximum level of mean power for spurious emissions radiated from an antenna appears to be the appropriate method to follow in pursuit of efficient spectrum utilization.



15. Comments are invited on the proposals made for Appendix 4 and particularly on the possibility of extending the Table in the Appendix beyond 960 MHz.
16. It has become apparent that some clarification is required on the provision of in-orbit spare satellites. These satellites are intended to provide a back-up in case of catastrophic failure or rapid deterioration of the primary satellite. In-orbit spare satellites, however, have an effect on the efficient use of the geostationary satellite orbit in that positions are occupied by satellites which are not used to provide a service. Eventually the increased congestion of the orbit caused by spare satellites could, unless the practice is controlled, lead ultimately to the denial to a country of access to the orbit. This matter is dealt with in the proposed ADD 470UA, ADD 470 UB and ADD 470 UC.
17. A proposal has been made that spare satellites be co-located with one of the prime satellites they are protecting. A view has been expressed that for services such as message or data which cannot be interrupted, co-location of a spare satellite with an operating satellite is not practical, since routine testing of the spare satellite would be very difficult. However, other alternative arrangements have been suggested and a review of these alternatives is being carried out to determine a suitable position regarding spare satellites.
18. A matter of concern regarding spare satellites is the obvious requirement to test them regularly. This could create problems if the spare satellite is co-located with the prime satellite, but we believe that these problems can be resolved.
19. More and more often the occasion arises when satellites of domestic or international networks have to be replaced on a planned basis as their useful life comes to an end. In such circumstances, a situation arises where one satellite in a network of satellites and earth stations is to be replaced by an identical satellite for operational reasons. In the case where the satellite network has been coordinated and notified according to the procedures in the Radio Regulations and satisfactory operational sharing with other networks has been achieved, it is, in our view, reasonable to require only a minimum of coordination for a replacement satellite of similar characteristics. With this in mind, it is proposed to add appropriate regulations to effect this intent.

20. As noted in the modifications to Article 1, it is considered that the role of passive satellites in telecommunications has generally been obviated by changing technology and system requirements. Thus it is our intent to de-emphasize the significance and status of passive satellites in the Radio Regulations. To this end, the definition of Passive Satellite has been suppressed and it is proposed to suppress the reference to passive satellites in Article 7, specifically in the 470 N series of regulations dealing with power flux density limits.

21. To ensure that passive satellites are not a major problem with respect to efficient spectrum utilization in the future, ADD 470 VH is proposed as an addendum to Article 7 Section IX, for the purpose of clarifying the status of such satellites.

22. Documentation has been received from Teleglobe Canada in support of new technical sharing criteria being promoted by Intelsat. Specifically, the subjects of coordination procedures and interference sharing criteria between space systems were addressed. In view of the complexity of these proposals and the necessity that these proposals be in harmony with CCIR Recommendations, it is felt premature to introduce any of these new criteria into these Second Draft Proposals. In preparation of subsequent proposals, this matter will be considered further.

INTRODUCTION TO ARTICLE 9 AND 9A

1. The Notification of frequency assignments to the IFRB and the coordination procedures to be applied in appropriate cases is a function undertaken by the Department of Communications with the cooperation, as necessary, of the Canadian operating entity involved. The essential objective of these procedures insofar as Canada is concerned are as follows:

a) to ensure that any new Canadian frequency assignment to terrestrial or space services applicable under No. 486 of Article 9 or of 639 BA of Article 9A receives the international recognition and therefore the international protection from interference which is available under the Radio Regulations, and

b) to ensure that any existing Canadian frequency assignments are adequately protected from new terrestrial or space services being established by another administration.

2. The above objectives also take into account the protection of notified positions of space stations on the geostationary-satellite orbit; the necessary time-delays for action to be taken under these procedures and the manner in which the IFRB is to process such notifications.

3. Following distribution of the first draft Canadian proposals we received enquiries about the possibility of shortening the periods of time required for frequency coordination transactions. There are, of course, a number of time frames in the procedures of articles 9 and 9A which are unavoidable for the most part. In addition however, some time is lost in the handling, mailing and distributing of information between administrations and the IFRB. One way of recovering some of this lost time would be to have a greatly enhanced computer capability at the ITU Headquarters in Geneva. Direct access of such a facility

by ITU member countries for inputting and distributing frequency coordination information would be a worthwhile development. These possibilities are being looked into but it is unlikely that such developments will come that quickly.

4. Included in the Notification Procedures and Administrative Regulations portion of the second draft proposals are proposed regulations which address the matter of "spare satellites". The existing Radio Regulations do not provide procedural guidelines for dealing with frequency coordination and notification in cases where a space station in a "spare satellite" is to be stationed on the geostationary orbit as a replacement for an operational space station in the event there should be a malfunction of the operational space station. As there seems to be a need to study possible design changes in future space stations which would permit testing of space stations located very close to an operational satellite, CCIR working groups have been requested to include this matter in their study programs.

5. Our proposals for Articles 9 and 9A are designed to enhance the procedures referred to above and to recognize the possibility of premature operational problems with a space station so as to allow for its replacement without further coordination and to take into account also the special operational needs of transportable earth stations. The proposed Resolutions A and B are designed to deal with the problems of recorded frequency assignments which may no longer be in conformity with the Table of Allocations because of amendments to the Table brought about by the 1979 Conference.



INTRODUCTION TO ADMINISTRATIVE REGULATIONS

1. The Administrative Regulations are those which pertain generally to special agreements, procedures in case of interference, reports of infringements, secrecy, licences, identification of stations and service documents.

2. Based on a review of the Administrative Regulations, it is considered that the provisions of these Regulations are for the most part, adequate in their present form.

The proposed revisions are the result of regulations amended or deleted because they have been overtaken by events, considered to require clarification or made consistent with other regulations.

3. Suggested amendments to Regulations 1561 and 1562, Article 41, for the purpose of facilitating the administration of communication with certain countries in the Amateur Experimental Service require clarification. If considered appropriate, they will be included in the supplementary second draft proposals.

ARTICLES

APPENDICES

RESOLUTIONS

RECOMMENDATIONS

EDITORIAL PRESENTATION

ADD	indicates an entire additional new provision
MOD	indicates an amendment to an existing provision
SUP	indicates the entire deletion of an existing provision
NOC	indicates that no changes are proposed

Any underlining in the body of the proposals indicates new words or text.

Any dashes throughout words or text indicates the deletion of existing words or text.

## Terminology

### ARTICLE 1

#### Terms and Definitions

1. For the purposes of these Regulations, the following terms shall have the meanings defined below. These terms and definitions do not, however, necessarily apply for other purposes.

#### Section I. General Terms

MOD 2 *Telecommunication:* Any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, ~~visual~~ optical or other electromagnetic systems.

Reason The term "visual" has been replaced by "optical" in the definition of telecommunication used in the Convention ever since the Plenipotentiary Conference of Geneva 1959.

MOD 7 *Radio Waves (~~or-Hertzian-Waves~~):* Electromagnetic waves of arbitrarily restricted to frequencies lower than 3000 GHz and not guided between transmitter and receiver propagated in-space-without by an artificial guide boundary such as wire or wave-guide.

Reason To recognize the fact that the upper frequency limit is currently under review. Also to clarify the meaning of "artificial guide".

Finally, Hertizian Wave is considered to be out-dated.

MOD 15 *~~Telemetering~~ Telemetry:* The use of telecommunication for automatically indicating or recording measurements at a distance from the measuring instrument.

ADD 15A *Telecommand:* The use of telecommunication for the transmission of signals to initiate, modify or terminate functions of equipment.

Reason This term is used in the present regulations and therefore needs to be defined.

MOD 16 ~~Radiotelemetering~~ Radiotelemetry: Telemetering by means of radio waves.

Reason The revisions to MOD 15, 16, 84AW, 84AX would make the definition more appropriate.

ADD 20A Earth Exploration

The measurement of the characteristics of the earth, its natural phenomena, and its atmospheric environment.

Reason To provide a generic term outlining the general application on which the associated services are based.

## Section II. Radio Systems, Services and Stations

MOD 21B Earth Station

A station located either on the Earth's surface or within the major portion of the Earth's atmosphere intended for communication:

- with one or more space stations; or
- with one or more ~~stations-of-the-same-kind-by-means of-one-or-more-passive-satellites-or~~ other objects in space.

MOD 21C Space Radiocommunication

Any radiocommunication involving the use of one or more space stations or ~~the-use-of-one-or-more-passive-satellites-or~~ other objects in space.

Reason Consequential to SUP 84BAD Passive Satellite.

ADD 21BB Transportable Earth Station: An earth station located on the Earth's surface intended to be used for indeterminate periods of time at unspecified fixed points within a defined service area.

Reason Used in RR MOD 639AR, MOD 639BD.

MOD 28 Broadcasting Service: A radiocommunication service in which the ~~transmission~~ emissions are intended for direct reception by the general public. This service may include sound ~~transmissions~~, television ~~transmissions~~ or other types of ~~transmissions~~ emissions.

Reason The use of the word "transmission" in the sense of emissions" in radiocommunication is deprecated and further this is to align this definition to the French version and according to CCIR Recommendation 325.

MOD 30 Mobile Service: A Any service of radiocommunication between mobile and land stations, or between mobile stations



Reason This is a generic term designating either Maritime Mobile, Aeronautical Mobile or Land Mobile Services.

MOD 31 *Land Station:* A station in ~~the~~ a mobile service not intended to be used while in motion.

Reason A mobile service is used to mean **one** of the mobile services.

MOD 32 *Mobile Station:* A station in ~~the~~ a mobile service intended to be used while in motion ~~or~~ and during halts at unspecified points.

Reason A mobile station is not intended to be used solely during halts at unspecified points but as well while the station is in motion.

ADD 75B *Earth Exploration Service*

A radiocommunication service between terrestrial stations intended to support Earth Exploration.

ADD 75C *Earth Exploration (Active Sensor) Service*

A service for Earth Exploration involving the emission and reception of radio waves by terrestrial stations.

ADD 75D *Earth Exploration (Passive Sensor) Service*

A service for Earth Exploration involving the reception of natural radio waves emitted by the earth and its atmospheric environment.

MOD 76 *Meteorological Aids Service:* An ~~radiocommunications~~ Earth Exploration service used for meteorological, including hydrological, observations. ~~and-explorations.~~

Reason To provide for a terrestrial counterpart of the Earth Exploration-Satellite service which is now required; to emphasize the need for spectrum for the use of active or passive sensors and to bring the Meteorological Aids Service within the confines of the Earth Exploration Service as done in the satellite service of this kind.

MOD 80      Standard Frequency and Time Service: A radiocommunication service for scientific, technical and other purposes, providing the transmission of specified frequencies, time signals, or both, of stated high precision, intended for general reception.

MOD 81      Standard Frequency and Time Station: A station in the standard frequency and time service.

Reason      In general the Standard Frequency Service and Time Signal Service are provided by the same station. It would seem appropriate to give them a name applying to both.

SUP 82      ~~Time-Signal-Service:--A-radiocommunication-service-for-the transmission-of-time-signals-of-stated-high-precision,-intended-for-general-reception.~~

Reason      Consequential to MOD 80.

ADD                      Section IIbis      - Non-radiocommunication Service

ADD 84AAA      Industrial - Scientific - Medical (ISM) Operations

Industrial, scientific and medical (ISM) operations involving apparatus which radiate or emit radio frequency energy for non-telecommunication purposes and which can interfere with other telecommunication services.

Reason      ISM is referred to in footnotes 161, 217, 225, 340, 357, 391 and 410C and consequently needs to be defined since certain parts of the spectrum have been designated for ISM and since these operations affect other services allocated in the same bands.

Section IIA Space Systems, Services and Stations

MOD 84AG *Fixed-Satellite Service*

A radiocommunication service:

- between earth stations ~~at specified~~ fixed points when one or more satellites are used; in some cases this service includes satellite to satellite links, ~~which may also be effected~~ when it is not possible to provide these in the inter-satellite service;
- for connection between one or more earth stations at ~~specified~~ fixed points and ~~satellites~~ used for a service other than the fixed-satellite service (for example, the mobile satellite service, ~~broadcasting-satellite-service etc.~~) where it is not possible to provide these connections in the auxiliary-satellite service;
- for earth-to-space connections from one or more earth stations at fixed points to satellites used for the broadcasting-satellite service.

Reason

The modification to sub-paragraph 1 is to permit the use of transportable earth stations in this service, and to direct satellite-to-satellite links to the inter-satellite service bands.

The added sentence to sub-paragraph 2 is intended to direct the user to the new ~~Auxiliary-Satellite Service~~ but not to exclude the use of the ~~Fixed-Satellite Service~~ when absolutely necessary.

The new third sub-paragraph is somewhat consequential to the modification of sub-paragraph 2 and explicitly defines up-links to the ~~Broadcasting Satellite Service~~ as falling within the ~~Fixed-Satellite Service~~.

MOD 84AGA *Mobile-Satellite Service*

A radiocommunication service:

- between mobile earth stations and one or more space stations; or between space stations used by this service;
- or between mobile earth stations by means of one or more space stations;

-- and if the system so requires, for connection between these space stations and one or more earth stations at specified fixed points; these latter connections could be performed in the auxiliary-satellite service or exceptionally in the fixed-satellite service.

Reason To clarify that links between earth stations at two fixed points may be defined in three possible services: the Mobile-Satellite Service, the Auxiliary-Satellite Service, or the fixed-satellite service, although the Auxiliary Satellite Service is preferred. Transportable earth stations will be included if the word "specified" is removed.

ADD 84AGAB Mobile Earth Station

An earth station in a mobile-satellite service primarily intended to be used while in motion and during halts at unspecified points.

Reason To indicate the general conditions under which earth stations in this service operate.

ADD 84AGE Auxiliary-Satellite Service

A radiocommunication service for connection between one or more earth stations at fixed points and one or more satellites used for other than the fixed-satellite service or the broadcasting-satellite service (for example, the mobile-satellite service). Connections between earth stations at unspecified fixed points via one or more satellites are also permitted. This service is subject to the same regulations as the fixed-satellite service.

Reason This new service is intended to provide for feeder links associated with the Mobile-Satellite Services, the Radionavigation Satellite Service or any other satellite services which requires small bandwidth connections in either direction. This new service should ease the pressure on the standard high-capacity fixed-satellite allocations by promoting efficient use of the geostationary satellite orbit and of the radio frequency spectrum.

To a large extent the only difference between this new service and the Fixed-Satellite Service is one of bandwidth with the former intended primarily for narrow-band operation and the latter primarily for wide-band operation.

MOD 84AP Broadcasting-Satellite Service

A radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception by the general public.



~~-- such information may be distributed to earth stations within the system concerned;~~

~~-- platform interrogation may be included.~~

ADD 84ASB Earth Exploration-Satellite (Active Sensor) Service

A service for Earth Exploration involving the emission and reception of radio waves by space stations or transmissions between space stations.

ADD 84ASC Earth Exploration-Satellite (Passive Sensor) Service

A service for Earth Exploration involving the reception by sensing instruments located on earth satellites of natural radio waves emitted by the earth and its atmospheric environment.

Reason for MOD 84ASA, ADD 84ASB, ADD 84ASC

To provide spectrum and protection for Earth Exploration-Satellite active and passive sensor operation. It is intended that bands allocated to the Earth Exploration-Satellite Service would be used primarily for data links including platform interrogation, rather than for the operation of active sensors.

MOD 84ATB Standard Frequency and Time Satellite Service

A radiocommunication service using space stations on earth satellites for the same purposes as those of the standard frequency and time service

Reason To align 84ATB with proposed MOD 80.

SUP 84ATG Time-Signal-Satellite-Service

~~A radiocommunication service using space stations on earth satellites for the same purposes as those of the time signal service.~~

Reason Consequential to MOD 84ATB.

MOD 84AW Space Telemetering Telemetry

The use of ~~telemetering~~ radiotelemetry for the transmission from a space station of results of measurements made in a spacecraft, including those relating to the functioning of the spacecraft.

MOD 84AX     *Maintenance Space ~~Telemetering~~ Telemetry*

Space ~~telemetering~~ relating exclusively to the electrical and mechanical condition of a spacecraft and its equipment together with the condition of the environment of the spacecraft.

Reason     Refer to the reasons given under MOD 16.

Section IIB Space, Orbits and Types of Objects in Space

MOD 84BAB     *Earth Satellite*

~~A-body~~ An object which revolves around the Earth ~~another-body of-preponderant-mass~~ and which has a motion primarily ~~and-permanently~~ determined by the force of gravitation ~~attraction of that-other-body~~ the Earth.

Reason     It seems preferable to define "earth satellite" than satellite considering the definition of satellite systems in 84AFA.

MOD 84BE     *Altitude of the Apogee (Perigee)*

The altitude of the apogee (perigee) of an earth satellite above a specified reference surface serving to represent the surface of the Earth.

Reason     To make the definition more accurate.

SUP 84BAB-1 <sup>1</sup> ~~A-body-so-defined-which-revolves-around-the-Sun-is-called a-planet-or-planetoid-~~

Reason     This is no longer necessary because the term "earth satellite" is now defined and the word "object" replaces "body" which requires no definition.

MOD 84BG     *Geostationary Satellite*

A geosynchronous satellite, the circular orbit of which lies in the plane of the Earth's equator and which turns about the polar axis of the Earth in the same direction ~~and-with the-same-period~~ as ~~those-of~~ the Earth's rotation.

The orbit on which a satellite should be placed to be a geostationary satellite is called the "geostationary satellite orbit".

Reason Results from/<sup>the</sup>proposed definition of "direct reception".

ADD 84AP Direct Reception (in the broadcasting-satellite service)  
bis

The reception of emissions from a space station in the broad-  
casting-satellite service encompassing both individual and  
community reception.

Reason This is considered preferable to footnote 84AP.1 Spa 2.

MOD 84APA Individual reception (in the broadcasting-satellite service)

Direct reception ~~The-reception-of-emissions-from-a-space-sta-  
tion-in-the-broadcasting-satellite-service~~ by simple domestic  
installations and in particular those utilizing small anten-  
nae.

MOD 84APB Community reception (in the broadcasting-satellite service)

Direct reception ~~The-reception-of-emissions-from-a-space-sta-  
tion-in-the-broadcasting-satellite-service~~ by receiving equip-  
ment, which in some cases may be complex and have antennae  
larger than those used for individual reception, and intended  
for use:

-- by a group of the general public at one location; or

-- through a distribution system covering a limited area.

Reason Consequential to ADD 84AP bis.

SUP 84AP.1 <sup>1</sup>~~In-the-broadcasting-satellite-service,-the-term-"direct-  
reception"-shall-encompass-both-individual-reception-and-com-  
munity-reception.~~

Reason No. 84AP.1 is no longer required as a result of ADD 84AP bis.

MOD 84ASA Earth Exploration-Satellite Service

A radiocommunication service between earth  
stations and one or more space stations in-which to support  
Earth Exploration.

-- ~~information-relating-to-the-characteristics-of-the-Earth  
and-its-natural-phenomena-is-obtained-from-instruments  
on-earth-satellites;~~

-- ~~similar-information-is-collected-from-airborne-or-earth  
based-platforms;~~

Reason To make use of 84BFA Spa 2.

SUP 84BAG *Active-Satellite*

~~An earth-satellite-carrying-a-station-intended-to-transmit or-retransmit-radiocommunication-signals.~~

SUP 84BAD *Passive-Satellite*

~~An earth-satellite-intended-to-transmit-radiocommunication signals-by-reflection.~~

Reason The term "Passive Satellite" has outlived its usefulness and the deletion of the term "Active Satellite" is consequential.

### Section III Technical Characteristics

ADD 87A *Carrier*

An electromagnetic wave that is available for modulation and is characterized by its frequency, phase and amplitude.

Reason To define a term used extensively in Regulations (Art.2, Para 200, 444B etc.)

ADD 87B *Modulation*

The process by which certain characteristics of a carrier are modified in accordance with certain characteristics of another wave or signal.

Reason To define a term extensively used in Radio Regulations (see ADD 87A).

MOD 89 *Assigned Frequency Band:* The frequency band ~~the centre of which coincides with the frequency assigned to the station~~ and the width of which equals the necessary bandwidth plus twice the absolute value of the frequency tolerance.

Reason To avoid circular definition with 85 and to relate to operational reality. This definition makes clear that the Assigned Frequency Band is the basic unit and Assigned Frequency is derived from it.

MOD 90 *Occupied Bandwidth:* The width of a frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated, excluding spurious emissions, are each equal to 0.5% of the total mean power radiated-by of a given emission. (Note: In some cases, for example multi-channel frequency-division systems, the percentage of 0.5%



may lead to certain difficulties in the practical application of the definitions of occupied and necessary bandwidth; in such cases a different percentage may prove useful.)

Reason For clarity and precision. Spurious emissions are excluded to account for systems with high level harmonic emissions.

ADD 91A Emissions: The electromagnetic energy which emanates from a source in a radio system.

Reason To define a term extensively used in Radio Regulations (See MOD 92, ADD 92C, ADD 92D), and as requested by Administrative Conference of the ITU in Rec. 8, 1959.

Background To cover emissions from all sources of radio systems.

MOD 92 Spurious Emission: Emissions on a frequency or frequencies which are outside the necessary band, and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions and intermodulation products, but exclude out-of-band emissions. in-the-immediate-vicinity-of-the-necessary-band, which-are-a-result-of-the-modulation-process-for-the-transmission-of-information.

Reason To use new definition 92A

ADD 92A Out-of-band Emission: Emissions on a frequency or frequencies in the immediate vicinity of the necessary band, which results from the modulation process.

Reason In accordance with CCIR Recommendation 328-3.

ADD 92B Unwanted Emission: Spurious emission and out-of-band emission.

Reason In accordance with CCIR Recommendation 328-3.

ADD 92C Interference: The effect of unwanted energy due to one or a combination of emissions, radiations, or inductions upon reception in a radiocommunication system, manifested by any performance degradation, misrepresentation, or loss of information which could be extracted in the absence of such unwanted energy.

Reason Required by MOD 93. In accordance with latest Draft Recommendation AA/1 of the CCIR.

ADD 92D Permissible Interference: Observed or predicted interference which complies with quantitative interference and sharing criteria contained in the Radio Regulations or in Recommendations of the CCIR or in regional arrangements as provided for in the Radio Regulations.

Reason Useful term. In accordance with the latest Draft Recommendation AA/1 of the CCIR.

MOD 93 Harmful Interference: Any interference emissions, ~~radiation or induction~~ which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunication service operating in accordance with these Regulations.

Reason To utilize 92C.

Background CCIR Draft Rec. AA/1 suppresses "radionavigation services" as being covered by "Safety Service". We feel that radionavigation service should be specifically highlighted.

ADD 93A Protection Ratio

The minimum value of the wanted to unwanted signal ratio such that under specified conditions, a specified impairment of the wanted signal at the output of a receiver is not exceeded.

Reason Used in RR 443, 434, Recommendation 3.

MOD 94 Power: Whenever the power of a radio transmitter, etc. is referred to, it shall be expressed in one of the following forms, according to the class of the emission:

-peak envelope power ( $P_p$ );

-mean power ( $P_m$ );

-carrier power ( $P_c$ ).

For different classes of emissions, the relationships between peak envelope power, mean power and carrier power, under the conditions of normal operation and of no modulation, are contained in Recommendations of the CCIR which may be used as a guide.

Reason For clarity and precision because not all emissions can be expressed in all the forms indicated.

MOD 97      *Carrier Power of a Radio Transmitter:* The average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle under conditions of no modulation. ~~This definition does not apply to pulse modulated emissions.~~

Reason      Unnecessary to specifically identify pulse modulated systems in the light of MOD 94.

MOD 98      *Effective Radiated Power:* The product of the power of an emission supplied to the antenna and ~~multiplied by~~ the relative gain ( $G_d$ ) of the antenna in a given direction.

Reason      To be parallel to 98A

MOD 98A      *Equivalent Isotropically Radiated Power (e.i.r.p.)*

The product of the power of an emission ~~as~~ supplied to ~~an~~ the antenna and the isotropic antenna gain ( $G_{is}$ ) of the antenna in a given direction ~~relative to an isotropic antenna.~~

Reason      To utilize terminology defined elsewhere.

MOD 99      *Gain of an Antenna:* The ratio of the power required at the input of a reference antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field strength at the same distance. When not specified otherwise, the figure expressing the gain of an antenna refers to the gain in the direction of the radiation main lobe. ~~In services using scattering modes of propagation the full gain of an antenna may not be realizable in practice and the apparent gain may vary with time.~~

Reason      Strength is a measured quantity. Scatter reference is wrong because Gain is an intrinsic property of the antenna and not of the system.

## ARTICLE 2

### Designation of Emissions

SUP 104-111

Reason: Major changes in format and content

ADD 104 § 1. Emissions are designated according to their necessary bandwidth and their classification. The full designation of the emission consists of an indication of the necessary bandwidth followed by the classification

#### Section I. Necessary Bandwidth

ADD 105 § 2. The necessary bandwidths shall be expressed by five characters as follows:

The first character shall be a letter H, K, M or G to designate Hz, kHz, MHz or GHz respectively. This shall be followed by a number composed of three digits and a decimal point. The number may not be less than 1.

Reason: To accommodate automated data processing.

#### Examples

<u>Necessary Bandwidth</u>	<u>Symbol</u>	<u>Necessary Bandwidth</u>	<u>Symbol</u>	<u>Necessary Bandwidth</u>	<u>Symbol</u>
25 Hz	H25.0	36 kHz	K36.0	27 MHz	M27.0
400 Hz	H400.	180 kHz	K180.	200 MHz	M200.
2.4 kHz	K2.40	1.25 MHz	M1.25	5.6 GHz	G5.60
12.5 kHz	K12.5	6.25 MHz	M6.25		

ADD 106 Necessary bandwidths of various classes of emissions and examples of the designation of emissions are given in Appendix 5.



## Section II. Classification

ADD 107 § 3. Emissions are classified and symbolized according to the following characteristics. Modulations used only for short periods for incidental periods such as identification, calling, etc., should be ignored.

- (1) Nature or type of modulation of main carrier,
- (2) Nature or composition of signal modulating the main carrier and nature of multiplexing.
- (3) Type of message transmitted.

ADD 108 § 4. First Symbol - Nature or type of modulation of main carrier

- 4.1 Emission of unmodulated carrier ..... N
- 4.2 Emission in which the main carrier is predominantly amplitude modulated
  - 4.2.1. Double-sideband ..... A
  - 4.2.2 Single-sideband, full carrier; it may include cases where sub-carriers are angle-modulated ..... H
  - 4.2.3 Single-sideband, reduced carrier; it may include cases where sub-carriers are angle-modulated ..... R
  - 4.2.4 Single-sideband, suppressed carrier; it may include cases where sub-carriers are angle-modulated ..... J
  - 4.2.5 Independent sideband; it may include cases where sub-carriers are angle-modulated .... B
  - 4.2.6 Vestigial sideband ..... C
- 4.3 Emission in which the main carrier is angle-modulated
  - 4.3.1 Frequency modulation ..... F
  - 4.3.2. Phase modulation ..... G
- 4.4 Emission of pulses (the carrier may, in addition, be frequency modulated)\*
  - 4.4.1 Unmodulated sequence of pulses ..... P

\* Emissions, where the main carrier is directly modulated by a signal which has been coded into quantized form (e.g. pulse code modulation), should be designated under §§ 4.2 or 4.3.

- 4.4.2 A sequence of pulses which are modulated:
  - 4.4.2.1 in amplitude ..... K
  - 4.4.2.2 in width/duration ..... L
  - 4.4.2.3 in position/phase ..... M
  - 4.4.2.4 by combinations of the foregoing  
or other means ..... S
- 4.5 Cases not covered above, in which an emission consists of the main carrier modulated, either simultaneously or in a pre-established sequence, in a combination of two or more of the following modes:
  - amplitude, - angle, - pulse ..... W
- 4.6 Cases not otherwise covered ..... X

D 109	5.	<u>Second symbol - Nature of signal modulating the main carrier and nature of multiplexing</u>	
	5.1	No modulating signal .....	N
	5.2	A single channel containing quantized information without the use of a modulating sub-carrier* .....	A
	5.3	A single channel containing quantized information with the use of a modulating sub-carrier* .....	B
	5.4	A single channel containing analogue information .....	C
	5.5	Two or more channels containing quantized information, operating simultaneously or in a pre-established sequence, all of which modulate the sub-carriers in frequency or phase,	
	5.5.1	Frequency-division multiplex .....	D
	5.5.2	Time-division multiplex .....	E
	5.5.3	Frequency-division multiplex with one or more channels using time-division multiplex .....	F
	5.5.4	Type of multiplexing other than above .....	G
	5.6	Two or more channels containing quantized information operating simultaneously or in a pre-established sequence.	
	5.6.1	Frequency-division multiplex .....	H
	5.6.2	Time-division multiplex .....	J
	5.6.3	Frequency-division multiplex with one or more channels using time-division multiplex .....	K
	5.6.4	Type of multiplexing other than above .....	L
	5.7	Two or more channels containing analogue information operating simultaneously or in a pre-established sequence.	
	5.7.1	Frequency-division multiplex .....	M

5.7.2	Time-division multiplex .....	P
5.7.3	Frequency-division multiplex with one or more channels using time-division multiplex .....	Q
5.7.4	Type of multiplexing other than above .....	R
5.8	Composite system transmitting simultaneously, or in a pre-established sequence, one or more channels containing quantized information, together with one or more channels containing analogue information,	
5.8.1	Frequency-division multiplex .....	S
5.8.2	Time-division multiplex .....	T
5.8.3	Frequency-division multiplex with one or more channels using time-division multiplex .....	U
5.8.4	Type of multiplexing other than above .....	V
5.9	Cases not otherwise covered .....	X

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\*This excludes time-division multiplex.



ADD 110

§ 6.	<u>Third symbol - Type of message transmitted</u>	
6.1	Unmodulated main carrier or pulses .....	N
6.2	Telegraphy - manual .....	A
6.3	Telegraphy - automatic .....	B
6.4	Facsimile .....	C
6.5	Data transmission, telemetry, telecommand .....	D
6.6	Telephony (including sound broadcasting) .....	E
6.7	Television (video) .....	F
6.8	Combination of telegraphy (automatic) and facsimile .....	G
6.9	Combination of telegraphy (automatic) and telephony .....	H
6.10	Combination of facsimile and telephony .....	J
6.11	Combination of telephony and television .....	K
6.12	Combinations of the above not otherwise covered ..	L
6.13	Cases not otherwise covered .....	X

ADD 111    § 7.    The classification of typical emissions is tabulated as follows. Additional examples may be found in appropriate CCIR documents.

Reason:    To update, using CCIR Rec. AB/1 as reference, modified as appropriate. Supplementary characteristic symbols not necessary for international regulations and hence not adopted.

EXAMPLES

Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4,5,6	
I. No modulation			
A. Emission of a radio-frequency carrier with no modulation			
A.1 No quantized or analogue information channels (CW radar)	or (AO (FO	NNN	
B. Unmodulated pulse train	PO	PNN	
C. Unmodulated pulse train using frequency-modulated carrier (chirp radar)	PO	PNN	
II. A single channel containing quantized information without the use of a modulating sub-carrier			
A. Emission predominantly amplitude-modulated			
A.1 Double-sideband (on-off keying)			
A.1.1 telegraphy using code with elements of differing numbers and/or durations, aural reception (Morse)	A1	AAA	
A.1.2 telegraphy using code with elements of differing numbers and/or durations, automatic reception (Morse)	A1	AAB	
A.1.3 telemetry using code with elements of the same number and duration, without error-correction	A1	AAD	

Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4, 5, 6	
B. Emission angle-modulated			
B.1 Telegraphy using code with elements of differing numbers and/or durations, automatic reception (frequency-shift keying, Morse)	F1	FAB	
B.2 Telegraphy using code with elements of the same number and duration without error-correction (frequency-shift keying, teleprinter)	F1	FAB	
B.3 Telegraphy using code with elements of the same number and duration with error-correction (frequency-shift keying, teleprinter)	F1	FAB	
B.4 Facsimile, quantized (weather chart)	F4	FAC	
B.5 Data transmission in quantized form	F1	FAD	
C. Emission of pulses			
C.1 A sequence of pulses modulated in code (telemetry signals)	PlC	SAD	



Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4,5,6	
III. A single channel using quantized information with the use of a modulating sub-carrier			
A. Emission predominantly amplitude-modulated			
A.1 Double sideband			
A.1.1 telegraphy using code with elements of differing numbers and/or durations for aural reception (Morse) (on-off keying of modulated carrier)	A2	ABA	
A.1.2 telegraphy using code with elements of differing numbers and/or durations for automatic reception (on-off keying of modulating sub-carrier)	A2	ABB	
A.2 Single-sideband, full carrier			
A.2.1 modulation by a continuous tone (Standard frequency emission)	A2H	HBX	
A.2.2 telegraphy using code with elements of the same number and duration without error-correction (sequential single frequency code selective calling signal, Appendix 20C of the Radio Regulations)	A2H	HBB	

Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4, 5, 6.	
A.3 Single-sideband, suppressed carrier			
A.3.1 telegraphy using code with elements of differing numbers and/or durations for automatic reception (on-off keying of modulating sub-carrier)	A2J	JBB	
A.3.2 telegraphy using code with elements of the same number and duration with error-correction (narrow-band direct-printing telegraphy)	A2J	JBB	
B. Emission angle-modulated			
B.1 Frequency modulation			
B.1.1 telegraphy using code with elements of the same number and duration with error-correction (narrow-band direct-printing signal, frequency-shift keying of modulating sub-carrier)	F2	FBB	

Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4, 5, 6	
IV. A single channel containing analogue information			
A. Emission predominantly amplitude-modulated			
A.1 Double-sideband			
A.1.1 sound channel of broadcasting quality	A3	ACE	
A.1.2 telephone channel with privacy device	A3	ACE	
A.1.3 telephone channel without privacy device	A3	ACE	
A.1.4 facsimile, analogue	A4	ACC	
A.2 Single-sideband, full carrier			
A.2.1 sound channel of broadcasting quality	A3H	HCE	
A.2.2 telephone channel of good commercial quality with privacy device	A3H	HCE	
A.3 Single-sideband, reduced carrier			
A.3.1 sound channel of broadcasting quality	A3A	RCE	

Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4. 5. 6	
A.4 Single-sideband, suppressed carrier			
A.4.1 telephone channel with separate frequency modulated signals to control the level of demodulated speech signals (Lincompax)	A3J	JCE	
A.4.2 analogue facsimile (frequency modulation of an audio frequency sub-carrier which modulates the main carrier in the single-sideband suppressed-carrier mode)	A4J	JCC	
A.5 Vestigial sideband			
A.5.1 sound channel of broadcasting quality	A3C	CCE	
A.5.2 monochrome television (video)	A5C	CCF	
A.5.3 colour television	A5C	CCF	



Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4, 5, 6	
B. Emission angle-modulated			
B.1 Frequency modulation			
B.1.1 sound channel of broadcasting quality	F3	FCE	
B.1.2 telephone channel with privacy device	F3	FCE	
B.1.3 analogue facsimile	F4	FCC	
B.1.4 Colour television (video)	F5	FCF	
C. Emission of pulses			
C.1 A sequence of pulses, modulated			
C.1.1 in amplitude			
C.1.1.1 telephone channel without privacy device	P3D	KCE	
C.1.2 in phase or position			
C.1.2.1 analogue data transmission	P1F	MCD	
C.1.2.2 analogue telecommand	P1F	MCD	

Description	RR Art. 2 Symbol	Symbols proposed ... in this method	
		§§ 4, 5, 6	
<p>V. Two or more channels containing quantised information operating simultaneously or in a pre-established sequence, all of which modulate the sub-carriers in frequency or phase</p> <p>A. Emission predominantly amplitude-modulated</p> <p>A.1 Double-sideband</p> <p>A.1.1 multichannel voice-frequency telegraphy with error-correction</p> <p>A.2 Single-sideband, reduced carrier</p> <p>A.2.1 multichannel voice-frequency telegraphy with error-correction in which some channels are time-division multiplexed</p> <p>A.3 Independent sidebands</p> <p>A.3.1 quantized facsimile in one sideband and multichannel voice-frequency telegraphy with error-correction and time-division multiplex in the other sideband</p>	<p>A7</p> <p>ATA</p> <p>A9B</p>	<p>ADB</p> <p>RDB</p> <p>BDG</p>	

Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4, 5, 6	
VI. Two or more channels containing quantized information operating simultaneously or in a pre-established sequence			
A. Emission predominantly amplitude-modulated			
A.1 Double-sideband (with two or more audio-frequency sub-carriers)			
A.1.1 standard frequency emission	A2	ALL	
B. Emission angle-modulated			
B.1 Frequency modulation			
B.1.1 Four-frequency duplex	F6	FLB	
B.2 Phase modulation			
B.2.1 Digital radio-relay system, in which the baseband is constituted by pulse-code modulated telephony channels in time-division multiplex and modulates the main carrier in quadrature phase-shift keying	F3	GIE	

Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4, 5, 6	
VII. Two or more channels containing analogue information operating simultaneously or in a pre-established sequence *			
A. Emission predominantly amplitude-modulated			
A.1 Single-sideband, full carrier			
A.1.1 several telephone channels in frequency-division multiplex	A3H	HME	
A.2 Single-sideband, reduced-carrier			
A.2.1 sound channels of broadcasting quality	A3A	RME	
A.3 Single-sideband, suppressed-carrier			
A.3.1 telephone channels of good commercial quality with privacy device	A3J	JME	
A.4 Independent sidebands			
A.4.1 sound channels of broadcasting quality	A3B	BME	
A.4.2 telephone channels of good commercial quality with privacy device	A3B	BME	
A.4.3 two analogue facsimile signals using frequency modulation of sub-carriers	A4B	BMC	
A.4.4 telephone channels, each with separate frequency-modulated signals to control the level of demodulated speech signal (Lincompex)	A3B	BME	

.../65

\* In the present set of examples, there are no examples of two or more channels containing analogue information in a pre-established sequence.



Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4, 5, 6	
B. Emission, angle-modulated			
B.1 Frequency modulation			
B.1.1 stereophonic sound channel of broadcasting quality	F3	FME	
B.1.2 telephone channels of good commercial quality	F3	FME	
B.1.3 FDM-FM radio-relay system, multi- channel telephony in which the base- band is constituted by frequency- division multiplex and modulates the main carrier in frequency	F3	FME	
B.1.4 colour television with four sound channels of broadcasting quality	F9	FMK	

Description	RR Art. 2 Symbol	Symbols proposed in this method	
		SS 4, 5, 6	
VIII. Composite systems, transmitting simultaneously or in a pre-established sequence one or more channels containing quantized information together with one or more channels containing analogue information			
A. Emission predominantly amplitude-modulated			
A.1. Double-sideband			
A.1.1 telegraphy using code with elements of differing numbers and/or durations for automatic reception (on one sub-carrier) together with one telephone channel (on a second sub-carrier)	A9	ASH	
A.1.2 VOR with voice consisting of the main carrier modulated by:			
- a 30 Hz sub-carrier,			
- a carrier resulting from a 9960 Hz tone frequency-modulated by a 30 Hz tone,			
- a telephone channel,			
- a 1020 Hz keyed tone for continual Morse identification	A9	ASL	

Description	RR Art. 2 Symbol	Symbols proposed in this method	
		§§ 4. 5. 6	
A.2 Independent sideband			
A.2.1 several telegraph channels using code with elements of the same number and duration with error-correction together with several telephone channels with privacy devices	A2B	BSH	
B. Emission, angle-modulated			
B.1 Frequency modulation			
B.1.1 several telegraph channels using code with elements of the same number and duration without error-correction (frequency-shift keying) together with several telephone channels	F9	FSH	

Section III. Nomenclature of the Frequency and Wavelength Bands used in Radiocommunication

MOD 112 § 8 The radio spectrum shall be subdivided into ~~nine~~ twelve frequency bands, which shall be designated by progressive whole numbers in accordance with the following table. Frequencies shall be expressed:

- in hertz (Hz) up to and including 3000 Hz
- in kilohertz (kHz) thereafter up to and including 3000 kHz
- in megahertz (MHz) thereafter up to and including 3000 MHz
- in gigahertz (GHz) thereafter up to and including 3000 GHz.

However, where adherence to these provisions would introduce serious difficulties, for example in connection with the notification and registration of frequencies, the lists of frequencies and related matters, reasonable departures may be made.

Nomenclature	Band Number	Frequency Range (lower limit exclusive, upper limit inclusive)	Corresponding Metric Subdivision
ELF	1	3 to 30 Hz	Decamegametric w
ELF	2	30 to 300 Hz	Megametric waves
ELF	3	300 to 3000 Hz	Decamyriametric
VLF	4	3 to 30 kHz	Myriametric waves
LF	5	30 to 300 kHz	Kilometric waves
MF	6	300 to 3000 kHz	Hectometric waves
HF	7	3 to 30 MHz	Decametric waves
VHF	8	30 to 300 MHz	Metric waves
UHF	9	300 to 3000 MHz	Decimetric waves
SHF	10	3 to 30 GHz	Centimetric waves
EHF	11	30 to 300 GHz	Millimetric waves
HHF	12	300 to 3000 GHz or 3 THz	Decimillimetric waves

Note 1: "Band Number N" extends from  $0.3 \times 10^N$  to  $3 \times 10^N$  Hz.

Note 2: Symbols and prefixes:

Hz = hertz

k = kilo ( $10^3$ ), M = mega ( $10^6$ ), G = giga ( $10^9$ ), T = tera ( $10^{12}$ ).

Note 3: Abbreviations for adjacent band designations:-

~~Band 3 = VLF~~      ~~Band 8 = VHF~~  
~~Band 5 = LF~~      ~~Band 9 = UHF~~  
~~Band 6 = MF~~      ~~Band 10 = SHF~~  
~~Band 7 = HF~~      ~~Band 11 = EHF~~

Reason: To include the ELF bands below 10 kHz, in accordance with Annex 1 of URSI Recommendation VIII.8 (Warsaw, 1972) and with CCIR Rec 431-2 note 4. HHF (hyper-high frequencies) is suggested to designate band 12. To identify bands for possible allocations to services.



ARTICLE 3

General Rules for the Assignment and Use of  
Frequencies

MOD 116

The frequency assigned to a station of a given service shall be separated from the limits of the band allocated to this service in such a way that, taking account of the frequency band assigned to a station, no harmful interference is caused to services to which frequency bands immediately adjoining are allocated. If a service allocated to an immediately adjoining frequency band is reportedly subject to harmful interference caused by a station whose occupied bandwidth is not wholly contained within the band allocated to the service rendered by that station, it shall be regarded as not complying with this provision.

## ARTICLE 5

### FREQUENCY ALLOCATIONS

Note: For purposes of these proposals, all services in the Table are categorized in the following manner:

- a) services, the names of which are printed in "small capitals" (example: FIXED; these services are called "primary" services;
- b) services, the names of which are printed in "grotesque light" (example: Radiolocation); these are "permitted" services;
- c) services, the names of which are printed in "italics" (example: *Mobile*); these are "secondary" services.

kHz

Region 1	Region 2	Region 3
Below 10	(Not Allocated) <u>157</u>	
<p>MOD 157 Administrations authorizing the use of frequencies below 10 kHz <del>for special national purposes</del> shall ensure that no harmful interference is caused thereby to the services to which the bands above 10 kHz are allocated (see also Art. 14 No. 699).</p> <p><u>Reason</u> To broaden the application of the footnote.</p>		
10-14	RADIONAVIGATION <i>Radiolocation</i>	
<p><u>Reason</u> The expected use of Radiolocation in this band did not materialize and therefore it is appropriate to suppress Radiolocation to protect the world-wide OMEGA navigation system.</p>		

kHz

Region 1	Region 2	Region 3
70-72 RADIONAVIGATION 162 161	70-90 FIXED MARITIME MOBILE 158 MARITIME RADIONAVIGATION 162 <i>Radiolocation</i>	70-90 FIXED MARITIME MOBILE 158 RADIONAVIGATION 162
72-84 FIXED MARITIME MOBILE 158 RADIONAVIGATION 162 161 163 <u>166A</u>		
84-86 RADIONAVIGATION 162 163 <u>166A</u>		
86-90 FIXED MARITIME MOBILE 158 RADIONAVIGATION 162 163 <u>166A</u>	164 <u>166A</u>	165 <u>166A</u>
90-110 FIXED <del>MARITIME-MOBILE-158</del> RADIONAVIGATION 163 166 167	90-110 RADIONAVIGATION <del>Fixed</del> <del>Maritime-Mobile-158</del> 166 167	90-110 <del>FIXED</del> <del>MARITIME-MOBILE-158</del> RADIONAVIGATION 166 167

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- 73 -

kHz

110-112 FIXED MARITIME MOBILE RADIONAVIGATION 163 <u>167</u> <del>168</del> <u>166A</u>	110-112 FIXED MARITIME MOBILE MARITIME RADIONAVIGATION 162	110-112 FIXED MARITIME MOBILE RADIONAVIGATION 162
112-115 RADIONAVIGATION 162 163 <u>166A</u>	<i>Radiolocation</i>	
115-126 FIXED MARITIME MOBILE RADIONAVIGATION 162 163 <u>167</u> <del>168</del> 169 <u>166A</u>		
126-129 RADIONAVIGATION 162 163		
129-130 FIXED MARITIME MOBILE RADIONAVIGATION 162 163 <u>167</u> <del>168</del>		
	164 <u>167</u> <del>168</del> <u>166A</u>	<u>167</u> <del>168</del> 170 <u>166A</u>
130-150 MARITIME MOBILE 172 Fixed 163 <u>167</u> 173	130-150 FIXED MARITIME MOBILE <u>167</u>	
150-160 MARITIME MOBILE 167 174 BROADCASTING 175	150-160 FIXED MARITIME MOBILE <u>167</u>	

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ADD 166A     In authorizing new assignments in the bands 80-90 kHz and 110-120 kHz, administrations are urged to take all practical measures to protect Loran-C receiving stations from harmful interference. Loran-C receiving stations should be of such a design that they are not unduly sensitive to interference from stations of other services operating in adjacent frequency bands.

Reason     Recently Loran-C systems have experienced interference from systems operating in adjacent frequency bands. Consequential to making the band 90-110 kHz exclusive Radionavigation, it is necessary to provide additional protection in adjacent bands.

MOD 167     Only classes A1 or F1, A4 or F4 emissions are authorized in the band 90 110-160 kHz for stations of the fixed service and in the band 110-160 kHz for stations of the maritime mobile service. Exceptionally, class A7J emissions are also authorized in the band 110-160 kHz for stations of the maritime mobile service.

Reason     The proposed suppression of the Fixed and Maritime Mobile services in the band 90-110 kHz is to make provision for world-wide operation of radionavigation systems such as Loran-C.

MOD 167 and the deletion of FN158 is consequential to the above.

SUP 168     ~~Aeronautical stations may use frequencies in the bands 110-112 kHz, 115-126 kHz and 129-130 kHz on a permitted basis for high-speed communications to aircraft.~~

Reason     The requirement for communication to aircraft in these frequency bands has not arisen.

kHz

Region 1	Region 2	Region 3
160-255 BROADCASTING     176	160- <del>200</del> <u>190</u> FIXED 179  <u>190-200</u> FIXED <u>AERONAUTICAL</u> <u>RADIONAVIGATION</u> 179	160-200 FIXED  <i>Aeronautical radionavigation</i>
255-285 MARITIME MOBILE 174 BROADCASTING AERONAUTICAL RADIONAVIGATION 176 177 178	200-285  AERONAUTICAL RADIONAVIGATION <i>Aeronautical mobile</i>	
<hr/>		
<u>Reason</u>	There is a need for increased allocation to the Aeronautical Radionavigation Service. The band 190-200 kHz will provide additional channels and it is compatible with existing equipment.	

kHz

Region 1	Region 2	Region 3
405-415 MOBILE except aero- nautical mobile AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radio direction- finding) 182 183 184	405- <del>415</del> <u>435</u> <del>MARITIME</del> RADIONAVIGATION ( <del>radio-direction-</del> <del>finding</del> ) (radiobeacons) Aeronautical-radio navigation Aeronautical mobile 182	405- <del>415</del> RADIONAVIGATION  <i>Aeronautical mobile</i>  182
415-490 <u>495</u> MARITIME MOBILE 185 186	415-490 <u>435-495</u> MARITIME MOBILE 186	415-490 <u>495</u> MARITIME MOBILE 186

Reason To provide for increased allocation to the Radionavigation Service. In the first draft it was proposed to share the 415-495 kHz band between the Aeronautical Radionavigation and Maritime Mobile Services, however, there was concern that due to the probability of long distance propagation at ~~these~~ frequencies, it was concluded that geographic sharing may not be possible. For this reason two exclusive bands are proposed.

MOD 182 In Regions 1 and 3 the frequency 410 kHz is designated for the ~~Maritime~~ Radionavigation Service (radio direction-finding). Other allocated services in the band 405-415 kHz shall not cause harmful interference to radio direction-finding. In the band 405-415 kHz no frequency shall be assigned to coast stations.

Reason A consequential revision.

kHz

Region 1	Region 2	Region 3
<p><del>490-510</del> <u>495-505</u></p> <p>MOBILE (distress and calling)</p> <p>187</p>		
<p><u>Reason</u> Due to the improved frequency stability, it is no longer necessary to have a 20 kHz bandwidth for international distress and calling frequency. Existing survival craft equipment may have some difficulty remaining within the 10 kHz bandwidth but this should not be a problem for new equipments. A future competent conference should set aside two 5 kHz bands for ship-to-ship and ship-to-shore calling (radiotelegraphy) including "digital" selective calling.</p>		
<p><del>510</del> <u>505-525</u></p> <p>MARITIME MOBILE 186</p> <p><i>Aeronautical radionavigation</i></p> <p>185</p>	<p><del>510-525</del> <u>505-515</u></p> <p>MARITIME MOBILE 186</p> <p>MOBILE</p> <p>Aeronautical Radionavigation</p> <p><u>515-525</u></p> <p>Aeronautical Radionavigation 188</p> <p><u>AERONAUTICAL RADIONAVIGATION</u></p>	<p><del>510</del> <u>505-525</u></p> <p>MARITIME MOBILE</p> <p><i>Aeronautical mobile</i></p> <p><i>Land mobile</i></p> <p>189</p>
<p><u>Reason</u> To retain provision for the Maritime Mobile Service and to increase the status of Aeronautical Radionavigation, it is proposed to provide two exclusive bands.</p> <p>Note: Consequential amendments to Article 32 will be required.</p>		

kHz

Region 1	Region 2	Region 3
1605-2000 FIXED MOBILE except aero- nautical mobile	1605- <del>1800</del> <u>1705</u> FIXED MOBILE AERONAUTICAL RADIONAVIGATION <del>Radiolocation</del> <u>BROADCASTING</u>	1605-1800 FIXED MOBILE  197
	<u>1705-1800</u> FIXED MOBILE <u>RADIODETERMINATION</u>	
	1800- <del>2000</del> <u>1900</u> AMATEUR FIXED MOBILE-except-aero- nautical-mobile RADIONAVIGATION 198	1800-2000 AMATEUR FIXED MOBILE except aeronau- tical mobile RADIONAVIGATION
	<u>1900-2000</u> <u>RADIODETERMINATION</u> 198	
192 193 194 195 195A	198	<u>198</u>

MOD 198

~~In region 2 the Loran system has priority. Other services to which the band is allocated may use any frequency in this band provided that they do not cause harmful interference to the Loran system.~~

In region 3 the Loran system in any particular area operates either on 1850 or 1950 kHz, the bands occupied being 1825-1875 kHz and 1925-1975 kHz respectively. Other services to which the band 1800-2000 kHz is allocated may use any frequency therein on condition that no harmful interference is caused to the Loran system operating on 1850 or 1950 kHz.

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.../79.



Reason In the band 1605-1800 kHz there has been a reduced requirement for the Fixed, Mobile and Aeronautical Radionavigation Services and an increased requirement for Broadcasting. Loran A which operated in the 1800-2000 band is being mostly phased out allowing for an exclusive allocation to Amateur in the band 1800-1900 kHz, and a continuation of Loran A at 1900-2000 kHz. Also, there is a continuing need for radiodetermination systems to operate in the 1900-2000 kHz band. In order to accommodate the Fixed Service systems currently operating in the band 1605-1705 ~~KHz~~, it is possible to make domestic provisions for the duration of their operational life.

It is intended to review the on-going use of this band for the Fixed and Mobile services and, if the use is further reduced, recommend the re-allocation of 1705-1750 kHz to Broadcasting. This re-allocation is conditional on a statement of proposed usage from the broadcasting community.

kHz

Region 1	Region 2	Region 3
2000-2045 <u>MARITIME MOBILE</u> <del>FIXED</del> <i>Fixed</i> <del>MOBILE-except-aero-</del> <del>nautical-mobile</del> <i>Land Mobile</i> 193 195A	2000-2065  <u>MARITIME MOBILE</u>	
2045-2065 <u>MARITIME MOBILE</u> METEOROLOGICAL AIDS <del>FIXED</del> <i>Fixed</i> <del>MOBILE-except-aero-</del> <del>nautical-mobile</del> <i>Land Mobile</i> 193 195A	 <del>FIXED</del> <i>Fixed</i> <del>MOBILE</del> <i>Land Mobile</i>  <i>Aeronautical Mobile</i>	

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kHz		
Region 1	Region 2	Region 3
2502- <del>2625</del> <u>2575</u> FIXED MOBILE except aero- nautical mobile (R) 193 195A	2505- <del>2625</del> <u>2575</u> FIXED MOBILE	
<u>2575-2625</u> FIXED <del>MOBILE-except-aero-</del> <del>nautical-mobile-(R)</del> <u>MARITIME MOBILE</u> <u>Fixed</u> <u>Land Mobile</u> 193 195A		
2625-2650 MARITIME MOBILE MARITIME RADIONAVIGATION	2625- <del>2850</del> <u>2575-2650</u> <u>MARITIME MOBILE</u> FIXED <u>Fixed</u> MOBILE <u>Land Mobile</u>	
2650-2850 FIXED MOBILE except aero- nautical mobile (R) 195A 205	<u>2650-2850</u> FIXED MOBILE	
<u>Reason</u> The bands 2000-2107 kHz and 2575-2650 kHz (the band 2065-2107 is already allocated to Maritime Mobile) are needed world-wide to provide common ship/shore and intership channels in accordance with Rec Mar 2-3.		
2850-3025	AERONAUTICAL MOBILE (R) 201A 205A	
3025- <del>3155</del> <u>3200</u>	AERONAUTICAL MOBILE (OR)	

kHz

Region 1	Region 2	Region 3
3155-3200	FIXED MOBILE-except-aeronautical-mobile-(R)	
<p>Reason It is expected that Appendix 26, the Frequency Allotment Plan for Aeronautical Mobile (OR) Service will be revised at some time in the next few years. In order to provide for those countries that are not in the existing plan but will be in the new plan, it is necessary to expand the frequency allocations to this service.</p>		

3500-3800 AMATEUR FIXED MOBILE-except-aero- nautical-mobile	3500-4000 3800 AMATEUR FIXED MOBILE-except-aero- nautical-mobile	3500-3800 AMATEUR FIXED MOBILE 206 207
3800-3900 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	3800-3900 FIXED MOBILE except aero- nautical mobile (R) AMATEUR	3800-3900 AMATEUR FIXED MOBILE 206 207
3900-3950 AERONAUTICAL MOBILE (OR)	3900-4000 BROADCASTING AMATEUR FIXED MOBILE-except aeronautical-mobile	3900-3950 AERONAUTICAL MOBILE BROADCASTING
3950-4000 FIXED BROADCASTING		3950-4000 FIXED BROADCASTING

kHz

Region 1	Region 2	Region 3
4000-4063	FIXED	
4063-	4000-4438	MARITIME MOBILE 208 209 209A
MOD 209	On condition that harmful interference is not caused to the maritime mobile service, the frequencies between <u>4063 4000</u> and 4438 kHz may be used exceptionally by fixed stations communicating only within the boundary of the country in which they are located <del>with a mean power not exceeding 50 watts; however, in Regions 2 and 3 between 4238 and 4368 kHz, a mean power not exceeding 500 watts may be used by such fixed stations.</del>	
<u>Reason</u>	<p>(proposals 3500-4438 kHz)</p> <p>The modifications to the band 3500-4438 kHz are intended to improve the following situations:</p> <ol style="list-style-type: none"> <li>1) While the Amateur Service had a large band allocated (3500-4000 kHz), interference from other services operating in other regions have limited the use of the upper part of this band during certain periods of the day. Also, increasing needs in this band for the fixed services may have eventually forced in Canada the implementation of the shared allocation. The exclusive allocation to the Amateur Service (3500-3800 kHz), should ensure a good environment for future amateur operation;</li> <li>2) There was a need for a moderate increase in the Fixed Service allocation at 400-4063 kHz. This has been achieved by suppressing the Amateur Service at 3800-3900 kHz and by modifying footnote 209.</li> <li>3) The Broadcasting Service required allocation in Region 2 below 4 MHz to provide medium distance coverage. The band 3900-4000 kHz will be suitable for this purpose.</li> <li>4) The Maritime Mobile Service has a requirement for more spectrum than the present allocation 4063-4438 kHz. By allocating 3800-3900 kHz to the Fixed service, the contiguous band 4000-4063 kHz can be allocated to the Maritime Mobile Service.</li> </ol>	

- 5) The power limitation in footnote 209 limits the usefulness of this band for the fixed service and it is also not necessary as the fixed service is already secondary to the maritime mobile service.

kHz		
Region 1	Region 2	Region 3
4700-4750 <u>4775</u>	AERONAUTICAL MOBILE (OR)	
4750-4775-4850 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE BROADCASTING 202	4750-4775-4850 FIXED BROADCASTING 202	
Reason See reason under band 3025-3200 kHz		

5005-5060	FIXED BROADCASTING 202
Reason	Suppress footnote 202 to make provision for world-wide broadcasting. Careful coordination of any use of this band by the Broadcasting Service should easily protect the current Fixed users of this band.

5950-6200 <u>6150</u>	BROADCASTING
6200-6525 <u>6150</u>	MARITIME MOBILE <u>211</u> 211A



MOD 211 On condition that harmful interference is not caused to the maritime mobile service, the frequencies between ~~6200~~ 6150 and 6525 kHz may be used exceptionally by fixed stations, communicating only within the boundary of the country in which they are located; ~~with a mean power not exceeding 50 watts. At the time of notification of these frequencies, the attention of the International Frequency Registration Board will be drawn to the above conditions.~~

Reason The maritime mobile service has an increased need for radio-telephone and direct printing radiotelegraph channels in the 6 MHz band, (see Rec. Mar 2-9). The additional spectrum proposed for the broadcasting service in the 4 MHz, 5 MHz and 7 MHz band should relieve some of the requirement for retaining all of the 5950-6200 kHz band for the broadcasting service. Consequentially, the band limits in footnote 211 must be amended.

The power limitation in footnote 211 limits the usefulness of this band for the fixed service and it is also not necessary as the fixed service is already secondary to the maritime mobile service.

kHz

6685-~~6765~~ 6785

AERONAUTICAL MOBILE (OR)

~~6765-6785-7000-6900~~

FIXED

Reason See reason under band 3025-3200 kHz.

~~7000~~ 6900-7100

AMATEUR

AMATEUR-SATELLITE

~~7100-7300~~ 7400

BROADCASTING

~~7100-7300~~ 7400

AMATEUR

BROADCASTING

~~7100-7300~~ 7400

BROADCASTING

212 212A212A212A

kHz

7300-8195 <u>7400-8100</u>	FIXED
<del>8195</del> <u>8100-8815</u>	MARITIME MOBILE 201A 213
ADD <u>212A</u>	<u>In Canada the band 7330-7340 kHz is allocated on a primary basis to the Standard Frequency and Time Service. In authorizing the utilization of this band for broadcasting, administrations are urged to take all practical measures to avoid interfering with this Service.</u>
<u>Reason</u>	<p>The unsatisfactory sharing experience by the Amateur and Broadcasting Services, will be obviated by the establishment of two exclusive bands. The proposals for the bands 6900-7100 and 7100-7400 are not separable. The broadcasting band is being expanded in order to alleviate the congestion in this band.</p> <p>CHU has been operating as a time and frequency standard on 7335 kHz for many years. CHU is used widely and it is proposed to provide international recognition to this service by providing a suitable footnote in the table.</p> <p>The Maritime Mobile Service has an increased need for radio-telephone and direct printing radiotelegraph channels in the 8 MHz band. (See Rec. Mar 2-9)</p>

8965-9040 <u>9060</u>	AERONAUTICAL MOBILE (OR)
<u>Reason</u>	<p>See reason under band 3025-3200 kHz.</p> <p>To make provision for countries to be added to Appendix 26 which do not have allotments in the present plan.</p>

kHz		
Region 1	Region 2	Region 3
9040-9500 <u>9060-9425</u>	FIXED	
9500-9775 <u>9425-9875</u>	BROADCASTING	
9775 <u>9875-9995</u>	FIXED	
<hr/>		
<u>Reason</u>	To provide additional spectrum to alleviate the congestion in the Broadcasting band.	

10100- <del>11175</del> <u>10300</u>	FIXED <u>AMATEUR</u> <u>AMATEUR SATELLITE</u>
<u>10300-11175</u>	FIXED
<u>Reason</u> To provide an amateur band between 7 and 14 MHz in order to cope with varying propagation conditions.  Note: In the first draft of the proposals it was indicated that this new band would be 300 kHz, however, it has been reviewed and reduced so as not to unduly constrain the adjacent Fixed band. It will be necessary to establish if the use of the 10.1-10.3 MHz band will interfere with commercial FM receivers that have a 10.7 MHz IF frequency.	

11400- <del>11700</del> <u>11650</u>	FIXED 216
<del>11700-</del> <u>11650</u> 11975	BROADCASTING

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kHz

11975- <del>12330</del> <u>12200</u>	FIXED
<del>12330</del> -13200 <u>12200</u>	MARITIME MOBILE 213
<u>Reason</u> The current congestion in the broadcast band 11700-11975 kHz and the maritime mobile band 12330-13200 kHz will be partly alleviated by the reallocation of small portions of the fixed bands. (See Rec. Mar 2-9)	

13360- <del>14000</del> <u>13900</u>	FIXED 217
<u>13900</u> -14000	<del>FIXED</del> <u>RADIO ASTRONOMY</u> 217
<u>Reason</u> To provide a radio astronomy band between 10-15 MHz for reasons identified in CCIR Report 224-3 (Rev 76) and in Report AM/2 and in compliance with Recommendation Spa 2-7 of the Radio Regulations.	

15100- <del>15450</del> <u>15550</u>	BROADCASTING
<del>15450</del> - <del>15762</del> <u>15550-16300</u>	FIXED
<del>15762</del> -15768-	FIXED

kHz

<del>15768-16460-</del>	FIXED
<del>16460</del> <u>16300-17360</u>	MARITIME MOBILE 213
<u>17360-<del>17700</del>-17600</u>	FIXED
<del>17700-17900</del> <u>17600</u>	BROADCASTING
<u>Reason</u> In order to alleviate the existing congestion in the Broad- casting and Maritime Mobile Services in this area of the spectrum.	

<u>23350-24990</u> <u>23550</u>	<del>FIXED</del> LAND-MOBILE <u>RADIO ASTRONOMY</u> 222 222A
<u>23550-24990</u> <u>24000</u>	FIXED LAND MOBILE 222 222A
<u>24000-24500</u>	<u>AMATEUR</u> <u>AMATEUR SATELLITE</u>

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kHz

24500-24990

FIXED

LAND MOBILE

222A

Reason

To provide an amateur band between 21 and 28 MHz in order to cope with varying propagation conditions.

The existing radio astronomy band 21850-21870 kHz is too narrow for reasons given in CCIR Report 224-3 (Rev. 76). Allocation of the wider band 23350-23550 kHz to Radio Astronomy would permit the release of the narrow band to another service.

MHz

Region 1	Region 2	Region 3
30.01- <del>37.75</del> <u>37.25</u>	FIXED 228 229 230 231 MOBILE 233A	
<del>37.75</del> -38.25 <u>37.25</u>	FIXED 228 229 231 MOBILE <del>Radio-Astronomy</del> <u>RADIO ASTRONOMY</u> <u>233B</u>	
<u>Reason</u>	To make provision for Radio Astronomy in this band on a Primary basis.	
MOD <u>233B</u>	In making assignments to stations of other services to which the bands <del>37.75</del> <u>37.25</u> - 38.25 MHz, 150.05-153 MHz, 406.1-410 MHz, <u>608-614 MHz</u> , <del>2690-2700 MHz</del> , <u>3325-3360 MHz</u> and <del>4700</del> <u>4950-5000 MHz</u> , 10.6-10.68 GHz are allocated, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference.	
<u>Reason</u>	The modification to footnote 233B takes into account the various amendments throughout the allocation Table.	

Region 1	Region 2	Region 3
68-74.8 FIXED MOBILE except aero- nautical mobile	68-73 FIXED MOBILE BROADCASTING	68-70 FIXED MOBILE AERONAUTICAL RADIONAVIGATION 254 255 256
248 249 250 251 252	73-74.6 RADIO ASTRONOMY <u>253A</u> 253B	70-74.6 FIXED MOBILE 256 257 258
MOD <u>253A</u> In Region 2, fixed, mobile and broadcasting service operations previously authorized in the band 73-74.6 MHz may continue to operate until <u>December 31, 1985</u> on a non-interference basis to the <u>Radio Astronomy Service</u> .		
<u>Reason</u> To strengthen the protection to the radio astronomy service in Region 2. The fixed mobile and broadcasting services do not use the band 73-74.6 MHz to any significant extent.  <u>Note:</u> Canadian assignments in this band include: 5 for radio astronomy, 8 for fixed stations of N.B. Department of Highways and 2 for fixed stations operated by CN in Newfoundland.		

117.975-132	AERONAUTICAL MOBILE (R) 201A 273 273A <u>273B</u>
ADD <u>273B</u>	<u>Space system techniques may be used to receive emissions from emergency position-indicating radio beacon stations at the frequencies 121.5 MHz, 156.75 MHz, and 243 MHz.</u>
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<u>Reason</u>	<p>It is considered appropriate to add footnote 273B to ease<sup>regula-</sup>tions associated with satellite-aided reception of emissions from emergency position-indicating radio beacon stations. This additional footnote would allow space system techniques to be used to receive emissions on emergency frequencies. While the frequency 156.75 MHz is included in this proposal, it is recognized that the inclusion of this frequency in the final proposal is contingent upon considerations now being given to the use of this frequency.</p>
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MHz

136-137	<p><del>SPACE-RESEARCH-(Space-to-Earth)</del>  <u>AERONAUTICAL MOBILE (R) 281AB</u>  <u>281A 281AA 281AC</u></p>
137-138	<p><del>SPACE-OPERATIONS-(telemetering-and-tracking)</del>  <del>METEOROLOGICAL-SATELLITE</del>  <del>SPACE-RESEARCH-(Space-to-earth)</del>  <u>AERONAUTICAL MOBILE (R) 281AB</u>  <u>275A 279A 281C 281E 281AD</u></p>
ADD <u>281AB</u>	<p><u>The 136-137 and 137-138 MHz bands are allocated to the Aeronautical Mobile (R) Service for use as of January 1, 1990.</u></p>
ADD <u>281AC</u>	<p><u>Until Jan. 1, 1990, the band 136-137 MHz is also allocated to the Space Research (Space-to-Earth) Service. As of Jan. 1 1990, no new stations in that service may be authorized. Stations authorized prior to Jan. 1, 1990 may continue to operate on a secondary basis.</u></p>
SUP <u>281A</u>	<p><del>For the use of the band 136-137 MHz, see Recommendation No. Spa-7.</del></p>

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ADD 281AD      <sup>137-138 MHz</sup>  
Until Jan. 1, 1990, the band ~~is~~ also allocated to the Space  
Operation (telemetry and tracking) Meteorological Satel-  
lite and Space Research (Space-to-Earth) services. As of  
Jan. 1, 1990, no new stations in these services may be autho-  
rized. However, stations authorized prior to Jan. 1, 1990  
may continue to operate on a secondary basis.

Reason      1) To accommodate critical shortage of VHF aeronautical mobile  
(R) channels for air traffic control purposes. Indications  
are that space operations are inclined to utilize higher  
bands and present use of 136-138 MHz band for space purposes  
is somewhat limited. Aeronautical mobile (R) service sta-  
tions will not move into this band until 1990, when space  
operations will no longer be authorized.

2) The Recommendation Spa 7 seems now unnecessary.



MHz

Region 1	Region 2	Region 3
150.05-151 FIXED MOBILE except aero- nautical mobile (R) RADIO ASTRONOMY 233B 285 286A	150.05- <del>174</del> <u>156.7625</u> FIXED MOBILE	150.05- <del>170</del> <u>156.7625</u> FIXED MOBILE
151-153 FIXED MOBILE except aero- nautical mobile (R) RADIO ASTRONOMY Meteorological Aids 233B 285 286A		
153-154 FIXED MOBILE except aero- nautical mobile (R) Meteorological Aids 285		
154-156.7625 FIXED MOBILE except aero- nautical mobile (R) 285 287 <u>287B</u> <u>273B</u>	<u>233B</u> <u>273B</u> 287 <u>287B</u>	287 <u>287B</u> <u>233B</u> 290 <u>273B</u>
<u>156.7625-156.8375</u> MARITIME MOBILE (distress, safety and calling) 201A 285 <u>287</u>		
ADD <u>273B</u> Refer to the band 117.975-132 MHz.		
MOD <u>233B</u> . Refer to the band 37.25-38.25 MHz.		
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## MHz

<del>156-174</del> <u>156.8375-174</u>	<u>156.8375-174</u>	<u>156.8375-170</u>
FIXED	FIXED	FIXED
MOBILE except aero- nautical mobile	MOBILE	MOBILE
285 287 <u>287B</u> 288	233A 287 <u>287B</u>	287 <u>287B</u>
		170-174
		FIXED
		MOBILE
		BROADCASTING

MOD 287

The frequency 156.8 MHz is the international distress safety and calling frequency for the maritime mobile VHF radiotelephone service. Administrations shall ensure that a guard band on each side of the frequency 156.8 MHz is provided. The conditions for the use of this frequency are contained in Article 35.

~~In the bands 156.025-157.425-MHz, 160.625-160.975-MHz and 161.475-162.025-MHz each administration shall give priority to the maritime mobile service on only such frequencies as are assigned to stations of the maritime mobile service by that administration (see Article 35):~~

~~Any use of frequencies in these bands by stations of other services to which they are allocated should be avoided in areas where such use might cause harmful interference to the maritime mobile VHF radio communication service.~~

~~However, the frequency bands in which priority is given to the maritime mobile service may be used for radio communications on inland waterways subject to agreements between interested and affected administrations and taking into account current frequency usage and existing agreements.~~

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ADD 287B

In the bands 156.025-156.7625 MHz, 156.8375-157.425 MHz, 160.625-160.975 MHz and 161.475-162.025 MHz, each administration shall give priority to the maritime mobile service on only such frequencies as are assigned to stations of the maritime mobile service by that administration (see Article 35).

Any use of frequencies in these bands by stations of other services to which they are allocated should be avoided in areas where such use might cause harmful interference to the maritime mobile VHF radio communication service.

However, the frequency bands in which priority is given to the maritime mobile service may be used for radio communications on inland waterways subject to agreements between interested and affected administrations and taking into account current frequency usage and existing agreements.

Reasons

(1) This proposal reflects the guard-band provided in Appendix 18 to provide exclusive status on a world-wide basis for the international distress safety and calling frequency 156.8 MHz and to make a consequential amendment to footnote 287 by amending footnote 287 and adding a new footnote 287B.

(2) For the addition of footnote 273B in the band 156.7625-156.8375, refer to the reason given under the band 117.975-132 MHz.

Region 1	Region 2	Region 3
216-223 AERONAUTICAL RADIONAVIGATION BROADCASTING 297 298 299 300 301 <u>320A</u>	216-220 FIXED MOBILE <del>RADIOLOCATION</del> <u>Radiolocation</u>	216-225 AERONAUTICAL RADIONAVIGATION <i>Radiolocation</i>
223-235 AERONAUTICAL RADIONAVIGATION <i>Fixed</i> <i>Mobile</i> 299 300 301 302 303 304 305	220-225 AMATEUR <u>320A</u> <del>RADIOLOCATION</del> <u>Radiolocation</u>	306 307 308 <u>320A</u>
	225-235 FIXED MOBILE	225-235 FIXED MOBILE AERONAUTICAL RADIONAVIGATION
<p><u>Reason</u> Primary status for the Radiolocation service is no longer required. Proposed secondary status would allow radiolocation on a non-interfering basis and thus would not entirely preclude radiolocation operations.</p>		
<p>MOD <u>320A</u> In the bands <u>222-223 MHz, 435-438 MHz, 1290-1300 MHz, 2300-2310 MHz, 3390-3400 MHz, 5650-5670 MHz, 10475-10500 MHz, and 240-250 GHz</u> the Amateur-Satellite Service may be authorized, on condition that no harmful interference shall be caused to other services operating in accordance with the Table. Administrations authorizing such use shall ensure that any harmful interference caused by emissions from an amateur-satellite is immediately eliminated in accordance with the provisions of No. 1567A.</p>		
<p><u>Reason</u> To provide allocations for the Amateur-Satellite Service on a non-interference basis.</p>		

MHz

Region 1	Region 2	Region 3
150.05-151 FIXED MOBILE except aero- nautical mobile (R) RADIO ASTRONOMY 233B 285 286A	150.05- <del>174</del> <u>156.7625</u> FIXED MOBILE	150.05- <del>170</del> <u>156.7625</u> FIXED MOBILE
151-153 FIXED MOBILE except aero- nautical mobile (R) RADIO ASTRONOMY Meteorological Aids 233B 285 286A		
153-154 FIXED MOBILE except aero- nautical mobile (R) Meteorological Aids 285		
154-156. <u>7625</u> FIXED MOBILE except aero- nautical mobile (R) 285 <del>287</del> <u>287B</u> <u>273B</u>	<u>233B</u> <u>273B</u> <del>287</del> <u>287B</u>	<del>287</del> <u>287B</u> <u>233B</u> 290 <u>273B</u>
<u>156.7625-156.8375</u> <u>MARITIME MOBILE (distress, safety and calling)</u> 201A 285 <u>287</u>		
ADD <u>273B</u> Refer to the band 117.975-132 MHz.		
MOD <u>233B</u> . Refer to the band 37.25-38.25 MHz.		
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MHz

<del>156-174</del> 156.8375-174	156.8375-174	156.8375-170
FIXED MOBILE except aero- nautical mobile	FIXED MOBILE	FIXED MOBILE
285 287 <u>287B</u> 288	233A 287 <u>287B</u>	<u>287</u> <u>287B</u>
		170-174 FIXED MOBILE BROADCASTING

MOD 287

The frequency 156.8 MHz is the international distress safety and calling frequency for the maritime mobile VHF radiotelephone service. Administrations shall ensure that a guard band on each side of the frequency 156.8 MHz is provided. The conditions for the use of this frequency are contained in Article 35.

~~In the bands 156.025-157.425-MHz, 160.625-160.975-MHz and 161.475-162.025-MHz each administration shall give priority to the maritime mobile service on only such frequencies as are assigned to stations of the maritime mobile service by that administration (see Article 35).~~

~~Any use of frequencies in these bands by stations of other services to which they are allocated should be avoided in areas where such use might cause harmful interference to the maritime mobile VHF radio communication service.~~

~~However, the frequency bands in which priority is given to the maritime mobile service may be used for radio communications on inland waterways subject to agreements between interested and affected administrations and taking into account current frequency usage and existing agreements.~~

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ADD 287B    In the bands 156.025-156.7625 MHz, 156.8375-157.425 MHz, 160.625-160.975 MHz and 161.475-162.025 MHz, each administration shall give priority to the maritime mobile service on only such frequencies as are assigned to stations of the maritime mobile service by that administration (see Article 35).

Any use of frequencies in these bands by stations of other services to which they are allocated should be avoided in areas where such use might cause harmful interference to the maritime mobile VHF radio communication service.

However, the frequency bands in which priority is given to the maritime mobile service may be used for radio communications on inland waterways subject to agreements between interested and affected administrations and taking into account current frequency usage and existing agreements.

Reasons    (1) This proposal reflects the guard-band provided in Appendix 18 to provide exclusive status on a world-wide basis for the international distress safety and calling frequency 156.8 MHz and to make a consequential amendment to footnote 287 by amending footnote 287 and adding a new footnote 287B.

(2) For the addition of footnote 273B in the band 156.7625-156.8375, refer to the reason given under the band 117.975-132 MHz.

MHz

Region 1	Region 2	Region 3
216-223 AERONAUTICAL RADIONAVIGATION BROADCASTING 297 298 299 300 301 <u>320A</u>	216-220 FIXED MOBILE <del>RADIOLOCATION</del> <u>Radiolocation</u>	216-225 AERONAUTICAL RADIONAVIGATION <i>Radiolocation</i>  306 307 308 <u>320A</u>
223-235 AERONAUTICAL RADIONAVIGATION <i>Fixed</i> <i>Mobile</i> 299 300 301 302 303 304 305	220-225 AMATEUR <u>320A</u> <del>RADIOLOCATION</del> <u>Radiolocation</u>	
	225-235 FIXED MOBILE	225-235 FIXED MOBILE AERONAUTICAL RADIONAVIGATION
<p><u>Reason</u> Primary status for the Radiolocation service is no longer required. Proposed secondary status would allow radiolocation on a non-interfering basis and thus would not entirely preclude radiolocation operations.</p>		
<p>MOD <u>320A</u> In the bands <u>222-223 MHz</u>, <u>435-438 MHz</u>, <u>1290-1300 MHz</u>, <u>2300-2310 MHz</u>, <u>3390-3400 MHz</u>, <u>5650-5670 MHz</u>, <u>10475-10500 MHz</u>, and <u>240-250 GHz</u> the <del>Amateur-Satellite</del> Service may be authorized, on condition that no harmful interference shall be caused to other services operating in accordance with the Table. Administrations authorizing such use shall ensure that any harmful interference caused by emissions from an amateur-satellite is immediately eliminated in accordance with the provisions of No. 1567A.</p>		
<p><u>Reason</u> To provide allocations for the <del>Amateur-Satellite</del> Service on a non-interference basis.</p>		

MHz

Region 1	Region 2	Region 3
235-267	FIXED MOBILE 201A 305 305A 308A 309 <u>273B</u>	
<hr/>		
<u>Reason</u>	For ADD <u>273B</u> refer to the band 117.975-132 MHz.	

MHz

Region 1	Region 2	Region 3
401-402	<p>METEOROLOGICAL AIDS SPACE OPERATION (Telemetry) 315A</p> <p><i>Earth Exploration-Satellite (Earth-to-Space)</i> <i>Fixed</i> <del><i>Meteorological-Satellite-(Earth-to-Space)</i></del> <i>Mobile</i> except aeronautical mobile 314 315 315B <del>3156</del> 316</p>	
402-403	<p>METEOROLOGICAL AIDS</p> <p><i>Fixed</i> <del><i>Meteorological-Satellite-(Earth-to-Space)</i></del> <i>Mobile</i> except aeronautical mobile <i>Earth Exploration-Satellite (Earth-to-Space)</i> 314 315 <del>3156</del> 316</p>	
SUP <del>3156</del> Spa-2	<p><del>In the band 401-403 MHz, earth-exploration-satellite-applica-</del> <del>tions, other than the meteorological-satellite-service, may</del> <del>also be used for Earth-to-Space transmission on condition</del> <del>that no harmful interference is caused to stations operating</del> <del>in accordance with the Table.</del></p>	
<u>Reason</u>	<p>The band 401-403 MHz is being used internationally in a wide variety of <del>satellite</del> data collection applications in the fields of meteorology, hydrography, oceanography, forestry, agriculture, volcanology, arctic environments, etc. Meteorological Satellite is deleted, and the Earth Exploration-Satellite Service is substituted. The definition of Earth Exploration-Satellite Service include those operations performed by the Meteorological Satellite <del>Service</del>.</p>	



MHz

Region 1	Region 2	Region 3
403-406 METEOROLOGICAL AIDS <i>Fixed</i> <i>Mobile</i> except aero- nautical mobile 314 315 316	403-406 METEOROLOGICAL AIDS <i>Fixed</i> <i>Mobile</i> except aero- nautical mobile <del>314</del> - <del>315</del> - <del>316</del> <u>315D</u> <u>315E</u>	403-406 METEOROLOGICAL AIDS <i>Fixed</i> <i>Mobile</i> except aero- nautical mobile <del>314</del> <del>315</del> 316
406.1-410 FIXED MOBILE except aero- nautical mobile RADIO ASTRONOMY  233B 314	406.1-410 FIXED MOBILE except aero- nautical mobile RADIO ASTRONOMY <u>MOBILE SATELLITE</u> <u>except aeronautical</u> <u>mobile-satellite</u> <u>(Earth-to-Space)</u> 233B <del>314</del> <u>315D</u>	406.1-410 FIXED MOBILE except aero- nautical mobile RADIO ASTRONOMY  233B <del>314</del>
<p>ADD <u>315D</u>      <u>In Canada, the bands 405.5-406 and 406.1-410 MHz are also allocated to the Aeronautical Mobile-Satellite Service (Earth-to-Space) on a secondary basis. The use of the 406.1-410 MHz band in Canada by the Aeronautical Mobile-Satellite Service will be restricted to geographical areas remote from all radio astronomy observatories.</u></p>		
<p>ADD <u>315E</u>      <u>In Canada, the band 405.5 to 406 MHz is also allocated on a primary basis to the Mobile-Satellite service (Earth-to-Space) except Aeronautical Mobile-Satellite.</u></p>		
<p><u>Reasons</u></p> <p>(1) Canada plans to implement an operational, multi-service satellite system to operate in the following frequency bands (earth-to-space link): 401-403 MHz, 405.5-406 MHz, 406-406.1 MHz and 406.1-410 MHz. Geographic sharing between Mobile Satellite except Aeronautical Mobile-Satellite and the existing Meteorological Aids and Radio Astronomy Services is therefore proposed in the 405.5 - 406 MHz band and in the 406.1-410 MHz band respectively.</p> <p>(2) Footnotes 314, 315, and 316 do not apply to Region 2. Footnotes 314 and 315 do not apply to Region 3.</p>		

MHz

Region 1	Region 2	Region 3
<p>420-430</p> <p>FIXED</p> <p>MOBILE except aero-nautical mobile</p> <p><i>Radiolocation</i></p> <p>318 319</p>	<p>420-430</p> <p>FIXED</p> <p>MOBILE except aero-nautical mobile</p> <p><i>Radiolocation</i></p> <p>RADIOLOCATION</p> <p><i>Amateur</i></p> <p>318 320A 324</p>	<p>420-450</p> <p>RADIOLOCATION</p> <p><i>Amateur 320A</i></p>
<p>430-440</p> <p>AMATEUR 320A</p> <p>RADIOLOCATION</p> <p>318 319 319B 320 321 322</p>	<p>430-450</p> <p>RADIOLOCATION</p> <p><i>Amateur 320A</i></p>	
<p>440-450</p> <p>FIXED</p> <p>MOBILE except aero-nautical mobile</p> <p><i>Radiolocation</i></p> <p>318 319 319A</p>	<p>318 319A 319B 324</p>	<p>318 319A 319B 323 324</p>
<p><u>Reason</u> Provide additional spectrum for low capacity fixed and for mobile systems.</p> <p><u>Note:</u> Footnote 318 concerning the operation of radio altimeters in the band 420-460 MHz will need to be revised.</p>		

MHz

Region 1	Region 2	Region 3
470-582 BROADCASTING	470-608 BROADCASTING 329A 332A	470-585 BROADCASTING 355
582-606 BROADCASTING RADIONAVIGATION 325 327 328 329	608-614 RADIO ASTRONOMY <i>Broadcasting</i>	585-610 RADIONAVIGATION 330B 336 337
606-790 BROADCASTING 329 330 330A 331 332 332A	BROADCASTING 233B 329A 332A 332	610-890 FIXED MOBILE BROADCASTING 330B 332 332A 338 339
790-890 FIXED BROADCASTING 329 331 333 334	614-806 BROADCASTING 329A 332A	
	806-890 See remarks in the introduction to Arti- cle 5	
<p>MOD 332 Spa</p> <p>In Region 1, except the African Broadcasting Area*, the band 606-614 MHz, and in Region 3, the band 610-614 MHz may be used by the radio astronomy service. Administrations shall avoid using the band concerned for the broadcasting service as long as possible, and thereafter, as far as practicable, shall avoid the use of such effective radiated powers as will cause harmful interference to radio astronomy observations.</p> <p><del>In Region 2, the band 608-614 MHz is reserved exclusively for the radio astronomy service until the first Administrative Radio Conference after 1 January 1974 which is competent to review this provision; however, this provision does not apply to Guba.</del></p>		
<u>Reasons</u>	<p>(1) MOD 332 is consequential to allocation proposals.</p> <p>(2) For MOD 233B refer to the band 37.25-38.25 MHz.</p>	
Note:	The need for operations involving the Mobile-Satellite service in the band 608-614 MHz is being considered.	

MHz

Region 1	Region 2	Region 3
890-942 FIXED BROADCASTING <i>Radiolocation</i>	890-902 FIXED RADIOLOCATION <i>Radiolocation</i> 339A 340	890-942 FIXED MOBILE BROADCASTING <i>Radiolocation</i>
	902-928 FIXED RADIOLOCATION <i>Radiolocation</i> <i>Amateur</i> 340 339A	
	928-942 FIXED RADIOLOCATION <i>Radiolocation</i> 339A 340	
329 331 333 339A		339 339A

Reasons (1) To provide additional protection for the fixed service.

Proposed secondary status would allow radiolocation on a non-interfering basis and thus would not entirely preclude radiolocation operations as in Regions 1 and 3.

(2) In order to allow the operation of the Amateur Service on a secondary basis.

MHz

Region 1	Region 2	Region 3
1215-1300	<p>RADIOLOCATION</p> <p><i>Amateur</i> <u>320A</u></p> <p>342 343 344 345 <u>345A</u></p>	
ADD <u>345A</u>	<p>In the bands 1215-1300 MHz, 3100-3300 MHz, 8550-8650 MHz, and 13.4-14.0 GHz, radar operations may be permitted in the earth exploration-satellite (active sensor) and earth exploration (active sensor) services, providing they do not introduce constraints, and do not cause harmful interference, to operations in the radiolocation service. Such use and development is subject to agreement and coordination between the administrations concerned and those having services, operating in accordance with the Table, which may be affected.</p>	
Reasons	<p>(1) The above bands for the Earth Exploration (Active Sensor) and for the Earth Exploration-Satellite (Active Sensor) Services were selected because of the similar characteristics of these the Radiolocation service and that this similarity would contribute to the compatible operation of these two new services in the bands indicated. These bands are required for multi-frequency radars used for the measurement of land features, ocean conditions such as wave height and wind speed, and meteorological parameters such as rain and snow.</p> <p>(2) Footnote 320A would allow Amateur-Satellite operations in the 1290-1300 MHz bands. (refer to the band 220-225 MHz )</p>	

services a  
that of

1300- <del>1350</del> <u>1365</u>	<p>AERONAUTICAL RADIONAVIGATION <u>346</u></p> <p><i>Radiolocation</i></p> <p>347 348 <u>349</u> <u>349A</u></p>	
<p><del>1350</del> <u>1365</u>-1400</p> <p>FIXED</p> <p>MOBILE</p> <p>RADIOLOCATION</p> <p>349 <u>349A</u></p>	<p><del>1350</del> <u>1365</u>-1400</p> <p>RADIOLOCATION</p> <p>349 <u>349A</u></p>	

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MOD <u>346</u>	The use of the bands <del>1300-1350</del> <u>1365</u> MHz, 2700-2900 MHz and 9000-9200 MHz by the aeronautical radionavigation service is restricted to ground-based radars and, in the future, to associated airborne transponders which transmit only on frequencies in these bands and only when actuated by radars operating in the same band.
MOD <u>349</u>	In <del>Region-2-and</del> Albania, Bulgaria, Hungary, Poland, Roumania, Czechoslovakia and the U.S.S.R., the existing installations of the radionavigation service may continue to operate, temporarily, in the band 1350-1400 MHz.
<u>Reason</u>	To provide for additional spectrum required for the Aeronautical Radionavigation service.
MOD <u>349A</u>	Radio astronomy observations on the Hydrogen line displaced towards lower frequencies are carried out in a number of countries under national arrangements. Administrations <del>should bear in mind the needs of the radio astronomy service in their future planning of</del> are urged to give all practicable protection in the band 1350-1400 MHz <u>for research in radio astronomy.</u>
<u>Reason</u>	To emphasize the ever-increasing importance of radio astronomy observations of the red-shifted Hydrogen line and the need for protection at the national level .

## MHz

1400-1427	<u>EARTH EXPLORATION (Passive Sensor)</u> <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> RADIO ASTRONOMY <u>412J</u>
<u>Reason</u>	To provide additional spectrum for passive sensors compatible with radio astronomy needs.

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MOD 412J All intentional emissions in the bands 1400-1427 MHz, 2690-2700 MHz, 10.68-10.7 GHz, 15.35-15.45 GHz, 23.6-24.0 GHz, 31.3-31.5 GHz, 31.5-31.8 GHz, 50-51 GHz, 51-52 GHz, 52-54.25 GHz, ~~54.25-58.2 GHz~~, 58.2-59 GHz, 64-65 GHz, 86-92 GHz, 100-101 GHz, 101-102 GHz, ~~130-~~ 139-140 GHz, 182-185 GHz and 230-240 GHz are prohibited. The use of passive sensors by other services is also authorized in these bands and such use shall be protected from interference to the same extent as for the services to which these bands are allocated. Insofar as the bands 2690-2700 MHz, 23.6-24.0 GHz and the band 31.3-31.8 GHz, footnotes 363, 364A, 364B, 405C, 407, and 412A may take precedence.

MHz

1427-1429

SPACE OPERATIONS (Telecommand) 349AA

FIXED

MOBILE except aeronautical mobile

ADD 349AA All space-to-earth transmissions are prohibited in this band.

Reason The new footnote 349 AA makes clear the need to eliminate space-to-earth transmissions in this band adjacent to the radio astronomy band 1400-1427 MHz. It is necessary to eliminate any ambiguity in the direction of transmission in the Space Operations (Telecommand) Service.

1429-1525	1429-1435	1429-1525
FIXED	FIXED	FIXED
MOBILE except aeronautical mobile	MOBILE	MOBILE
	1435-1525	
	MOBILE	
	<del>Fixed</del>	
	<u>FIXED</u>	

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Reason To provide additional spectrum for the Fixed Service on a primary basis to meet the growing demand of this service.

## MHz

1525-1535 SPACE OPERATION (Telemetry and tracking) 350A FIXED 350B <i>Earth Exploration- Satellite</i> <i>Mobile except aero- nautical mobile 350C</i>	1525-1535 SPACE OPERATION (Telemetry and tracking) 350A <i>Earth Exploration- Satellite</i> <i>Fixed</i> <i>Mobile 350D</i>	1525-1535 SPACE OPERATION (Telemetry and tracking) 350A FIXED 350B <i>Earth Exploration- Satellite</i> <i>Mobile</i>
SUP 350A <del>Space-stations-employing-frequencies-in-the-bands-1525-1535-MHz-for-telemetering-purposes-may-also-transmit tracking-signals-in-this-band.</del>		
<p><u>Reason</u> Consequential to the amendments in the Table since mention of tracking is more appropriate in the Table.</p>		

MHz

Region 1	Region 2	Region 3
1535-1542.5	MARITIME MOBILE-SATELLITE 352 352D <u>352E</u> <u>351A</u>	
1542.5-1543.5	<del>AERONAUTICAL-MOBILE-SATELLITE-(R)</del> MARITIME MOBILE-SATELLITE 352 352D <u>352E</u> <u>351A</u> <del>352F</del>	
1543.5- <u>1550</u>	<del>AERONAUTICAL-MOBILE-SATELLITE-(R)</del> <u>MARITIME MOBILE-SATELLITE</u> 352 352D <u>352E</u> <u>351A</u> <del>352G</del>	
<u>1550-1555</u>	AERONAUTICAL MOBILE-SATELLITE (R) <u>MARITIME MOBILE-SATELLITE</u> 352 352D <u>352F</u> <del>352G</del>	
<u>1555-1558.5</u>	AERONAUTICAL MOBILE-SATELLITE (R) 352 352D <u>352G</u>	
1558.5- <u>1570</u>	<del>AERONAUTICAL--RADIONAVIGATION</del> <u>AERONAUTICAL MOBILE-SATELLITE (R)</u> 352 <del>352A</del> <del>352B</del> 352D <del>352K</del> <u>352G</u>	
<u>1570-1624</u>	AERONAUTICAL RADIONAVIGATION 352 <u>352A</u> <u>352B</u> 352D <u>352K</u>	

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MHz

1624-1625	<u>AERONAUTICAL-RADIONAVIGATION</u> <u>AERONAUTICAL MOBILE-SATELLITE (R)</u> <u>MARITIME MOBILE-SATELLITE</u> <u>AUXILIARY-SATELLITE (Space-to-Earth)</u> 352 352A 352B 352D 352K 352GA
<u>1625-1636.5</u>	<u>AERONAUTICAL-RADIONAVIGATION</u> <u>MARITIME MOBILE-SATELLITE</u> 352 352A-352B 352D 352K 352H 351A
1636.5- <u>1640</u>	<u>MARITIME MOBILE-SATELLITE</u> 352 352D 352H 351A
<u>1640-1645</u>	<u>MARITIME MOBILE-SATELLITE</u> <u>AERONAUTICAL MOBILE-SATELLITE (R)</u> 352 352D 352H 352I
1645-1660	<u>AERONAUTICAL MOBILE-SATELLITE (R)</u> 352 352D 352J

.../114

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ADD 351A      The bands 1535-1550 MHz and 1625-1640 MHz may also be authorized for use by the mobile-satellite service. The use and development of this service shall be subject to agreement between the administrations concerned and those having services, operating in accordance with the Table, which may be affected.

Reason      A new footnote ADD 351A has been proposed to provide for an increased operational flexibility in the use of maritime mobile-satellite systems taking into account that this increased flexibility is particularly desirable in the remote areas of the world where space techniques offer a viable solution to numerous social needs.

MOD 352A  
Spa 2      The bands ~~1558.5-1636.5~~ 1570-1624 MHz, 4200-4400 MHz, 5000-~~5250~~ 5270 MHz and ~~15.4-15.7~~ 15.45-15.75 GHz are reserved on a world-wide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities.

MOD 352B  
Spa 2      The bands ~~1558.5-1636.5~~ 1570-1624 MHz, 5000-~~5250~~ 5270 MHz, and ~~15.4-15.7~~ 15.45-15.75 GHz are also allocated to the aeronautical mobile (R) service for use and development of systems using space radiocommunication techniques. Such use and development is subject to agreement and coordination between the administrations concerned and those having services, operating in accordance with the Table, which may be affected.

MOD 352E      The use of the band 1535-~~1542.5~~ 1550 MHz is limited to transmissions from space to earth stations in the maritime mobile-satellite service for communication and/or radiodetermination purposes. Transmissions from coast stations directly to ship stations, or between ship stations, are also authorized when such transmissions are used to extend or supplement the satellite-to-ship links.

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.../115

MOD <u>352F</u>	The use of the band <del>1542.5-1543.5</del> <u>1550-1555</u> MHz is limited to transmissions from space to earth stations in the aeronautical mobile-satellite (R) and maritime mobile-satellite services for communication and/or radiodetermination purposes. Transmissions from land stations directly to mobile stations, or between mobile stations, of the aeronautical mobile (R) and maritime mobile services, are also authorized. The utilization of this band is subject to prior operational coordination between the two services.
MOD <u>352G</u>	The use of the band <del>1543.5-1558.5</del> <u>1555-1570</u> MHz is limited to transmissions from space to earth stations in the aeronautical mobile-satellite (R) service for communication and/or radiodetermination purposes. <u>This also includes transmissions from space stations to earth stations at fixed points when such transmissions are used to extend or supplement the satellite to aircraft links.</u> Transmissions from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to aircraft links.
<u>Reason</u>	Modifications to footnotes 352G and MOD 352J are to remove possible constraints or the use of the aeronautical mobile satellite bands for communication between earth stations used in that service.
ADD <u>352GA</u>	<u>The band 1624-1625 MHz is reserved solely for the use and development of emergency position-indicating radio beacon (EPIRB) systems using space techniques. The use of this band is limited to transmissions from space to earth stations in the maritime mobile-satellite service, aeronautical mobile satellite service, and fixed-satellite service.</u>
MOD <u>352H</u>	The use of the band <del>1636.5-1644</del> <u>1625-1640</u> MHz is limited to transmissions from earth to space stations in the maritime mobile-satellite service for communication and/or radiodetermination purposes. Transmissions from ship stations directly to coast stations, or between ship stations, are also authorized when such transmissions are used to extend or supplement the ship-to-satellite links.

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MOD <u>352I</u>	The use of the band <del>1644-1645</del> <u>1640-1645</u> MHz is limited to transmissions from earth to space stations in the aeronautical mobile-satellite (R) and maritime mobile-satellite services for communication and/or radiodetermination purposes. Transmissions from mobile stations directly to land stations, or between mobile stations, of the aeronautical mobile (R) and maritime mobile services, are also authorized. The utilization of this band is subject to prior operational coordination between the two services.
MOD <u>352J</u> Spa 2	The use of the band 1645-1660 MHz is limited to transmissions from <del>earth</del> to space stations in the aeronautical mobile-satellite (R) service for communication and/or radiodetermination purposes. <u>This also includes transmissions from earth stations at fixed points to space stations when such transmissions are used to extend or supplement the aircraft-to-satellite links.</u> Transmissions from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.
MOD <u>352K</u>	Radio astronomy observations on important spectral lines due to the hydroxyl radical OH at frequencies 1612.231 MHz and 1720.530 MHz are carried out in a number of countries under national arrangements; the bands observed being <del>1611.5-1612.5</del> <u>1610.6-1613.8</u> MHz and 1720-1721 MHz respectively. <del>Administrations should bear in mind the needs of the radio astronomy service in their future planning of the bands 1558.5-1636.5 MHz and 1710-1770 MHz</del> <u>are urged to give all practicable protection to the radio astronomy service in the bands 1610.6-1613.8 MHz and 1720-1721 MHz.</u>
<u>Reason</u>	To provide additional protection for the Radio Astronomy Service.

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.../117

General reasons for modifications to the 1535-1660 MHz Bands

(1) The allocations to the maritime mobile-satellite service have been expanded to take account of recent traffic projections. The frequency bands allocated to the Aeronautical Mobile-Satellite and Maritime Mobile-Satellite Services on a co-primary basis have been expanded to permit and foster the planning of dual-service satellites. Provision has been made for the operation of search and rescue satellite systems (e.g., SARSAT) through a new allocation at 1624-1625 MHz (see ADD 352GA). The above-noted changes have been accomplished through a reduction in the allocation to aeronautical radionavigation (originally 1558.5-1636.5 MHz) which, it is believed, will not be technically deleterious to known services operating, or planned to operate, within this band.

(2) The modifications to various footnotes as indicated are only consequential to the change in the limits of some of the bands outlined above.



MHz

Region 1	Region 2	Region 3
1660-1670 <u>1664.4</u>	METEOROLOGICAL AIDS RADIO ASTRONOMY <u>353A</u> 354 354A 354B	
<u>1664.4-1668.4</u>	<del>METEOROLOGICAL AIDS</del> RADIO ASTRONOMY <u>353A</u> 354 354A 354B	
<u>1668.4-1670</u>	METEOROLOGICAL AIDS RADIO ASTRONOMY <u>353A</u> 354 354A 354B	
MOD <u>353A</u>	In view of the successful detection by astronomers of two hydroxyl spectral lines in the regions of 1665 MHz and 1667 MHz administrations are urged to give all practicable protection in the band 1660-1670 MHz for future research in radio astronomy <del>particularly by eliminating air-to ground transmissions in the meteorological aids service in the band 1664.4-1668.4 MHz as soon as practicable.</del>	
<u>Reason</u>	To continue the process begun at the 1971 WARC of eliminating airborne transmitters of the Meteorological Aids Service from this band which is important to the Radio Astronomy Service.	

1670-1690	METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (Space-to-Earth) <u>324A</u> <u>354E</u> MOBILE except aeronautical mobile 354
cont'd on next page .../119	



324A- 354E It is intended that meteorological-satellite space stations operating in the band 1670-1690 MHz shall transmit to selected earth stations. The location of such earth stations is subject to agreement between the administrations concerned and those having services, operating in accordance with the Table, which may be affected.

Reason To locate the footnote more sequentially.

## MHz

1710-1770 FIXED <i>Mobile</i> <u>352K</u> 356	1710-1770 FIXED MOBILE <u>352K</u> 356A
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Reason For MOD 352K refer to the band 1570-1624 MHz.

## MHz

2300-2350 FIXED <i>Amateur</i> <u>320A</u> <i>Mobile</i> <i>Radiolocation</i> <u>MARITIME RADIONAVIGATION</u> 359A 357 358 359	2300-2350 RADIOLOCATION <i>Amateur</i> <u>320A</u> <i>Fixed</i> <i>Mobile</i> <u>MARITIME RADIONAVIGATION</u> 359A <del>357</del> 360
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2350-2450 FIXED <i>Amateur</i> <i>Mobile</i> <i>Radiolocation</i> 357 358 359	2350-2450 RADIOLOCATION <i>Amateur</i> <i>Fixed</i> <i>Mobile</i> 357 360
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ADD 359A	<u>The Maritime Radionavigation service is limited to shore-based radars.</u>
Reasons	<p>To provide an allocation for use by shore-based radars in geographical areas where heavy rainfall precludes the use of higher bands.</p> <p>Footnote 320A would allow the amateur-satellite operations in the band 2300-2310 MHz. (Refer to the band 220-225 MHz)</p>

MHz

2500-2535	2500-2535
FIXED 364C	FIXED 364C
MOBILE except aeronautical mobile	<del>FIXED-SATELLITE-(Space-to-Earth)</del>
<u>AUXILIARY-SATELLITE (Space-to-Earth)</u>	<u>AUXILIARY-SATELLITE (Space-to-Earth)</u>
BROADCASTING-SATELLITE 361B	MOBILE except aeronautical mobile
361A 362 364F	BROADCASTING-SATELLITE 361B
	361A 364E 364F
2535-2550	
	FIXED 364C
	MOBILE except aeronautical mobile
	BROADCASTING-SATELLITE 361B
	361A 362 364F
Reason	To provide a frequency allocation for the newly-defined Auxiliary Satellite Service. Consistent with the general objective of introducing this new service, such a narrow band is re-allocated to the Auxiliary Satellite Service.
SUP 364E	<del>The use of the bands 2500-2535-MHz and 2655-2690-MHz by the fixed-satellite service is limited to domestic and regional systems and such use is subject to agreement between the administrations concerned and those having services operating in accordance with the Table, which may be affected (see Article 9A).--In the direction space-to-earth, the power flux density at the Earth's surface shall not exceed the values given in No. 470NE.</del>

<u>Reason</u>	Consequential to reallocation of <del>Fixed-Satellite</del> Service to <del>Auxiliary-Satellite</del> Service. The <del>Auxiliary-Satellite</del> Service is intended to cover the feeder links to mobile-satellites and other satellite services.
---------------	--

2655-2690 FIXED 364C 364D MOBILE except aero- nautical mobile <u>AUXILIARY-SATELLITE</u> <u>(Earth-to-Space)</u> BROADCASTING-SATELLITE 361B 364H 363 364 364F 364G	2655-2690 FIXED 364C 364D <del>FIXED-SATELLITE-(Earth-to-Space)</del> MOBILE except aeronautical mobile BROADCASTING-SATELLITE 361B 364H <u>AUXILIARY-SATELLITE (Earth-to-Space)</u> 364E 364F 364G
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<u>Reason</u>	To provide a frequency allocation for the newly-defined <del>Auxiliary-Satellite</del> Service. Consistent with the general objective of introducing this new service, such a narrow band is reallocated to the <del>Auxiliary-Satellite</del> Service.
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SUP 364G <del>Spa2</del>	<del>Radio-astronomy-observations-in-the-band-2670-2690-MHz-are carried-out-in-a-number-of-countries-under-national-arrange-ments.--Administrations-should-bear-in-mind-the-needs-of-the radio-astronomy-service-in-their-future-planning-of-this band.--</del>
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SUP 364H	<del>In-the-design-of-systems-in-the-broadcasting-satellite-ser-vice;--administrations-are-urged-to-take-all-necessary-steps to-protect-the-radio-astronomy-service-in-the-band-2690-2700-MHz--</del>
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<u>Reason</u>	Consequential to the proposed deletion of Radio Astronomy in the band 2690-2700 MHz.
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Note:	The band 2655-2690 MHz is also being considered for allocation to the Earth Exploration (Passive Sensor) and the Earth Explo-ration-Satellite (Passive Sensor) Services.
-------	--

MHz

Region 1	Region 2	Region 3
2690-2700	<p><u>RADIO-ASTRONOMY</u></p> <p><u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u></p> <p><u>EARTH EXPLORATION (Passive Sensor)</u></p> <p><u>233B 363 364A 364B 412J</u></p>	
<u>Reasons</u>	<p>This proposal is one of several in the frequency range extending up to approximately 40 GHz, designed to specify, along with presently existing allocations and other proposals, a suitably distributed series of allocations to the <b>Earth</b> Exploration Services for the passive remote sensing of earth surface and atmospheric constituents and parameters. In combination, these bands provide the spread of frequencies for the operation of Multifrequency Radiometers in the measurement of water salinity, sea ice, snow and ice morphology, soil moisture, cloud, rain, and water vapour. The multitude of bands is needed to estimate the separate radiant sources where the individual spectra are broad and overlapping.</p> <p>The reason for deleting Radio Astronomy in the above bands is that the band is too narrow and an alternative band 3325-3360 MHz is proposed.</p>	

MHz

2700-2900	<p><u>AERONAUTICAL RADIONAVIGATION 346</u></p> <p><i>Radiolocation</i></p> <p><u>366</u></p>	
<u>MOD 366</u>	<p>In the band 2700-2900 MHz ground-based radars used for meteorological purposes are authorized to operate on a basis of equality, and shore-based radars used for maritime radionavigation purposes are authorized to operate on a permitted basis, both with respect to stations of the aeronautical radionavigation service.</p>	
<u>Reason</u>	<p>1) MOD 366 would retain existing protection for meteorological radars and would also provide for shore-based radars for maritime radio navigation purposes on a permitted basis in geographical areas where the adjacent band 2900-3100 MHz is congested by mobile stations in the primary services.</p> <p>2) Re MOD 346, refer to the band 1300-1365 MHz.</p>	



MHz

Region 1	Region 2	Region 3
3100-3300		
<u>RADIONAVIGATION</u> <u>RADIOLOCATION</u> <u>345A 354 368 369 370A</u>		
3300-3400 <u>3325</u> RADIOLOCATION  370 371	3300-3400 <u>3325</u> RADIOLOCATION <i>Amateur</i> 376	
<u>3325-3360</u> RADIOLOCATION <u>RADIO ASTRONOMY</u>  370 371 <u>370A</u>	<u>3325-3360</u> RADIOLOCATION <u>RADIO ASTRONOMY</u> <i>Amateur</i> 376 <u>370A</u>	
<u>3360-3400</u> RADIOLOCATION  370 371	<u>3360-3400</u> RADIOLOCATION <i>Amateur</i> <u>320A</u> 376	
<hr/>		
SUP 368 <del>In-Albania,-Austria,-Belgium,-Bulgaria,-Hungary,-Poland,-Roumania,-Sweden,-Switzerland,-Czechoslovakia-and-the-U.S.S.R.-the-band-3100-3300-MHz-is-also-allocated-to-the-radionavigation-service-</del>		
<hr/>		
SUP 369 <del>In-the-and-3100-3300-MHz-existing-radar-beacons-(racons)-and-shipborne-radars-in-merchant-ships-may-operate-within-the-band-3100-3266-MHz-</del>		
<hr/>		
ADD <u>370A</u> <u>Radio astronomy observations on the important spectral lines due to the CH radical at frequencies of 3263.788 MHz, 3335.475 MHz and 3349.185 MHz are being carried out in a number of countries. Administrations are urged to give all practicable protection to the radio astronomy service for spectral line and continuum observations in the band 3325-3360 MHz and for spectral line observations in the band 3261.8-3265.8 MHz.</u>		
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Reasons

(1) The allocation proposed for the Radionavigation service in the 3100-3300 MHz band is to provide for additional requirements needed for this service in this part of the spectrum.

(2) The addition of footnote 345A in the band 3100-3300 MHz would allow for radar operations in the Earth Exploration (Active Sensor) and the Earth Exploration-Satellite (Active Sensor) services under certain conditions. (Refer to the band 1215-1300 MHz)

(3) Footnote 369 has been deleted as a consequence of the proposal for the band 3100-3300 MHz.

\*

(4) Protection is needed for radio astronomy observations of the three important spectral lines of the CH radical. In addition, the existing allocation at 2690-2700 MHz is too narrow and can be released in favour of a wider allocation which also provides protection for two of the three CH spectral lines.

(5) The suppression of footnote 368 in the band 3100-3300 MHz is consequential to the addition of the Radionavigation service in this band.

(6) The addition of footnote 320A in the band 3360-3400 MHz would provide for Amateur-Satellite operations between 3390-3400 MHz. (Refer to the band 220-225 MHz)

MHz

Region 1	Region 2	Region 3
<u>3400-3500</u> FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE <i>Radiolocation</i> 372 373 374 375	3400-3500  FIXED-SATELLITE (Space-to-Earth) RADIOLOCATION <i>Amateur</i> 376	
<u>3500-3600</u> FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE <i>Radiolocation</i> <u>AUXILIARY-SATELLITE</u> (Space-to-Earth) 372 373 374	<u>3500-3600</u> FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE RADIOLOCATION <u>AUXILIARY-SATELLITE</u> (Space-to-Earth) <i>Radiolocation</i>	<u>3500-3600</u> FIXED-SATELLITE (Space-to-Earth) RADIOLOCATION <i>Fixed</i> <i>Mobile</i> <u>AUXILIARY-SATELLITE</u> (Space-to-Earth) <i>Radiolocation</i> 377
<u>3600-3700</u> FIXED FIXED-SATELLITE <u>378A</u> (Space-to-Earth) <i>Mobile</i> <u>AUXILIARY-SATELLITE</u> (Space-to-Earth) 374	<u>3600-3700</u> FIXED FIXED-SATELLITE <u>378A</u> (Space-to-Earth) MOBILE RADIOLOCATION <u>AUXILIARY-SATELLITE</u> (Space-to-Earth) <i>Radiolocation</i>	<u>3600-3700</u> FIXED-SATELLITE <u>378A</u> (Space-to-Earth) RADIOLOCATION <u>AUXILIARY-SATELLITE</u> (Space-to-Earth) <i>Fixed</i> <i>Mobile</i> <i>Radiolocation</i> 377 378
<u>3700-4200</u> FIXED FIXED-SATELLITE (Space-to-Earth) <i>Mobile</i> 374	<u>3700-4200</u> FIXED FIXED-SATELLITE (Space-to-Earth) <i>Mobile</i> 379	

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ADD 378A	<u>In the bands 3600-3700 MHz and 6425-6525 MHz the fixed-satellite service is restricted to single-channel-per-carrier or other frequency-division multiple-access systems.</u>
<u>Reasons</u>	<p>(1) The Auxiliary-Satellite Service is added on a primary basis in the 3500-3700 MHz band to provide space-to-earth feeder links between mobile satellites of various types and their earth stations at specified fixed locations.</p> <p>(2) The Fixed-Satellite Service in the band 3600-3700 MHz is restricted to thin route applications (eg. SCPC or FDMA systems), to facilitate frequency and orbit sharing with the basically narrow band Auxiliary-Satellite Service.</p>

MHz

4400-4700	
FIXED	
FIXED-SATELLITE (Earth-to-Space, <u>Space-to-Earth</u> ) 382B	
ADD 382B	<u>In Region 2 the fixed-satellite service in the band 4400-4700 MHz is limited to international systems in the space- to earth direction and to domestic systems in the earth-to-space direction.</u>
<u>Reason</u>	To provide a frequency allocation for fixed-satellite systems in the <del>space-to-earth</del> direction in response to an international requirement and also an <del>Earth-to-Space</del> Fixed-Satellite Service allocation for domestic systems. In Region 2 this can be accommodated by using different orbit allocations for the different services.

MHz

Region 1	Region 2	Region 3
4700-4990 <u>4950</u>  FIXED  MOBILE  233B 354 <u>382A</u> 382B		
<u>4950-4990</u>  FIXED  MOBILE <u>except aeronautical mobile</u>  RADIO ASTRONOMY  233B 354 <u>382A</u> 382B		
4990-5000 FIXED MOBILE <u>except aero-nautical mobile</u> RADIO ASTRONOMY <u>233B</u>	4990-5000 RADIO ASTRONOMY FIXED MOBILE <u>except aero-nautical mobile</u> <u>383A</u> <u>233B</u>	4990-5000 FIXED MOBILE <u>except aero-nautical mobile</u> RADIO ASTRONOMY <u>233B</u>
MOD <u>382A</u> Radio astronomy observations on the formaldehyde line (rest frequency 4829.649 MHz) are <del>being</del> carried out in a number of countries under national arrangements. Administrations <del>should bear in mind the needs of the radio astronomy service in their future planning of the band 4825-4835 MHz.</del> <u>are urged to give all practicable protection to the radio astronomy service in the band 4826.6-4832.6 MHz.</u>		
<u>Reason</u> The importance of the spectral line of formaldehyde to radio astronomy is emphasized by strengthening footnote 382A. To provide the necessary level of protection for the radio astronomy service over the required bandwidth, footnote 382B is replaced with a table allocation.		
SUP 383A <del>In Cuba, the band 4990-5000 MHz is also allocated to the fixed and mobile services, and the provisions of No. 233B apply.</del>		
<u>Reasons</u> (1) Footnote 383A is no longer necessary as fixed and mobile are now included in the Table.  (2) The modification to footnote 233B is consequential to the change to the band limits proposed above for the Radio Astronomy Service (refer to the band 37.25-38.25 MHz).		

MHz

Region 1	Region 2	Region 3
5000-5250	AERONAUTICAL RADIONAVIGATION <u>352A 352B 383B</u>	
5250-5255	RADIOLOCATION <i>Space Research</i> 384 <u>352B 352A 383B</u>	
5255-5350	RADIOLOCATION 384 384A <u>352B 352A 383B</u>	
MOD <u>383B</u> Spa2	The bands <u>5000-5270</u> <sup>/5250</sup> MHz <del>to</del> and 15.45-15.75 GHz are also allocated to the <del>fixed-satellite-service</del> <u>auxiliary satellite service</u> for connection between one or more earth stations at <del>specified</del> fixed points on the Earth and satellites used by the aeronautical mobile (R) service and/or the radio-determination service. Such use and development shall be subject to agreement and coordination between the administrations concerned and those having services, operating in accordance with the Table, which may be affected.	
<u>Reasons</u>	(1) To make provision for the use of wideband signal format on aeronautical satellites operating in the 5 and 15 GHz <del>range</del> . (2) For MOD 352A and 352B, refer to the band 1570-1624 MHz.	

MHz

5650-5670	RADIOLOCATION <i>Amateur</i> <u>320A</u> 388 389
<u>Reason</u>	MOD 320A will provide for operation for the <del>Amateur-Satellite Service</del> throughout this band. (Refer to the band 220-225 MHz.)



MHz

Region 1	Region 2	Region 3
5725-5850 FIXED-SATELLITE (Earth-to-Space) RADIOLOCATION <i>Amateur</i> 354 388 390 391 <u>391A</u>	5725-5825 RADIOLOCATION <i>Amateur</i> 389 391 <u>391A</u>	
	5825-5850 RADIOLOCATION <u>FIXED-SATELLITE (Earth-to-Space)</u> <i>Amateur</i> 389 391 <u>391A-</u>	
5850-5925 FIXED FIXED-SATELLITE (Earth-to-Space) MOBILE 391	5850-5925 RADIOLOCATION <u>FIXED-SATELLITE</u> <u>(Earth-to-Space)</u> <i>Amateur</i> 391	5850-5925 FIXED FIXED-SATELLITE (Earth-to-Space) MOBILE <i>Radiolocation</i> 391
5925-6425 FIXED FIXED-SATELLITE (Earth-to-Space) MOBILE		
6425-6525 FIXED-SATELLITE (Earth-to-Space) 378A <u>AUXILIARY-SATELLITE (Earth-to-Space)</u> FIXED MOBILE 379A 392AA 393		
6525-6625 AUXILIARY-SATELLITE (Earth-to-Space) FIXED MOBILE 393		

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## MHz

6625-6925FIXED-SATELLITE (Earth-to-Space)

FIXED

MOBILE

392AA 393A6925-7250

FIXED

MOBILE

392AA 392B 393AMOD 391A

Radio astronomy observations are being carried out in the ~~bands~~ band 5750-5770 MHz ~~and 36.458-36.488-GHz~~ in a number of countries under national arrangements. Administrations are urged to take all practicable steps to protect radio astronomy observations ~~in these bands~~ from harmful interference.

SUP 392AA  
Spa2

~~In Brazil, Canada and the United States of America, the band 6625-7125 MHz is also allocated, on a secondary basis, to the fixed-satellite service for space-to-Earth transmissions. In Region 2, the power flux density produced by space stations in this band shall be in accordance with the provisions of No. 470NM. In Regions 1 and 3, it shall be at least 6dB lower. Receiving earth stations in this band may not impose restrictions on the locations or technical parameters of existing or future terrestrial stations of other countries.~~

ADD 393A

The band 6625-7250 MHz may be used for operations in the Earth Exploration-Satellite (Passive Sensors) and the Earth Exploration (Passive Sensors) Services. Administrations should bear in mind the needs of these passive operations in their future planning of this band.

Reasons

- (1) In conjunction with proposals for fixed satellite allocation between 3600 and 4700 MHz, to provide for the expansion of the fixed satellite services in the 5825-6525 MHz bands.
- (2) In conjunction with the proposal in the 3500 to 3700 MHz band, to provide an up band for the ~~Auxiliary-Satellite~~ Service at 6425-6625 MHz.
- (3) Re ADD 393A, these passive operations would be carried out to study both land and ocean features.

(4) Re SUP 392AA, the need for this footnote appears to be no longer required in view of the proposed above amendments to the Table.

(5) Re ADD 378A, refer to the band 3600-3700 MHz.

MHz

7250-7300

FIXED-SATELLITE (Space-to-Earth)  
MOBILE-SATELLITE (Space-to-Earth)  
~~392D~~ 392G

7300-7450

FIXED  
 FIXED-SATELLITE (Space-to-Earth)  
 MOBILE  
~~392D~~

7450-7550

FIXED  
 FIXED-SATELLITE (Space-to-Earth)  
 METEOROLOGICAL-SATELLITE (Space-to-Earth)  
 MOBILE  
~~392D-~~

7550-7750

FIXED  
 FIXED-SATELLITE (Space-to-Earth)  
 MOBILE  
~~392D~~

7975-8025

FIXED-SATELLITE (Earth-to-Space)  
MOBILE-SATELLITE (Earth-to-Space)  
 392H

SUP 392D  
Spa2

~~As an exception, passive fixed satellite systems also may be accommodated in the band 7250-7750 MHz subject to:~~

- ~~a) -- agreement between the administrations concerned and those having services, operating in accordance with the Table, which may be affected;~~
- ~~b) -- the coordination procedures laid down in Articles 9 and 9A.~~

~~Such systems shall not cause any more interference at active earth station receivers than would be caused by the fixed or mobile service. -- Power flux density limitations at the Earth's surface after reflection from the passive fixed satellites shall not exceed those prescribed in the present Regulations for active fixed satellite systems.~~

Reasons

- 1) There is a requirement to operate mobile earth stations in conjunction with fixed earth stations operating in the bands 7250-7300 MHz and 7975-8025 MHz.
- 2) It is proposed to suppress 392D since the use of passive satellites appears to have outlived their usefulness.

Note:

The use of the Auxiliary-Satellite Service for the bands 7250-7300 MHz and 7975-8025 MHz is to be considered.

MHz		
Region 1	Region 2	Region 3
8500-8750	RADIOLOCATION <u>345A</u> 354 395	
8750-8850	RADIOLOCATION AERONAUTICAL RADIONAVIGATION 396 <u>397</u>	
8850-9000	<u>MARITIME RADIONAVIGATION</u> <u>397A</u> <u>397</u> RADIOLOCATION 398	
9000-9200	AERONAUTICAL RADIONAVIGATION 346 <i>Radiolocation</i> <u>397</u>	
9200-9300	<u>MARITIME RADIONAVIGATION</u> <u>397</u> <u>397A</u> RADIOLOCATION 398	
9500-9800	<u>RADIONAVIGATION</u> RADIOLOCATION 398	

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.../134



MOD 397 In Belgium, France, the Netherlands and the F.R. of Germany, the bands 8825-9225 8850 MHz and 9000-9200 MHz ~~to~~ are also allocated to the maritime radionavigation service noting that in these countries all the bands from 8825 MHz to 9225 MHz are for use by shore-based radars.

ADD 397A In the bands 8850-9000 MHz and 9200-9300 MHz the Maritime Radionavigation Service is limited to shore-based radars.

MOD 398 In Albania, Australia, Bulgaria, Hungary, Poland, Roumania, Sweden, Switzerland, Czechoslovakia and the U.S.S.R., the bands 8850-9000 MHz, and 9200-9300 MHz ~~and 9500-9800 MHz~~ are also allocated to the radionavigation service.

- Reasons
- 1) The amendments to the bands 8850-9000 MHz, 9200-9300 MHz and 9500-9800 MHz are to provide for the increasing requirements of each of the Maritime Radionavigation and the Radionavigation Services in this area of the spectrum. The amendment to footnote 397 and the suppression of the band 9500-9800 MHz in footnote 398 are consequential to the above proposals.
  - 2) Re MOD 397 and 398 these are consequential to the proposed allocations to the Maritime Radionavigation Service in the bands 8850-9000 MHz and 9200-9300 MHz.
  - 3) ADD 397A is to provide for shore-based radars for Maritime Radionavigation purposes in geographical areas where the adjacent band 9300-9500 MHz is congested by mobile stations in the primary service.
  - 4) ADD 345A, refer to the band 1215-1300 MHz.

MHz

10000-10500

RADIOLOCATION

*Amateur* 320A

401A 402 403

Reason MOD 320A would provide for the operation of amateur-satellites in the 10475-10500 MHz. (Refer 220-225 MHz)

GHz

Region 1	Region 2	Region 3
10.6-10.68	<p>FIXED</p> <p>MOBILE <u>except aeronautical mobile</u></p> <p>RADIO ASTRONOMY</p> <p><u>EARTH EXPLORATION (Passive Sensors)</u></p> <p><u>EARTH EXPLORATION SATELLITE (Passive Sensors)</u></p> <p><i>Radiolocation</i></p> <p>404A</p>	
10.68-10.7	<p>RADIO ASTRONOMY</p> <p><u>EARTH EXPLORATION (Passive Sensors)</u></p> <p><u>EARTH EXPLORATION SATELLITE (Passive Sensors)</u></p> <p><u>412J 405B</u></p>	
<p><u>Reason</u> 1) To provide for additional spectrum for passive sensor operations.</p> <p>2) For MOD 412J refer to the band 1400-1427 MHz.</p>		

GHz

10.7-10.95	<p>FIXED</p> <p>MOBILE</p> <p><u>FIXED-SATELLITE (Space-to-Earth) 404B</u></p>
11.2-11.45	<p>FIXED</p> <p>MOBILE</p> <p><u>FIXED-SATELLITE (Space-to-Earth)</u></p>

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ADD 404B	Administrations are urged, in their planning of the band 10.7-10.95 GHz for the <del>ixed-</del> atellite service, to give all practicable protection to the passive services in adjacent bands 10.6-10.68 GHz and 10.68-10.7 GHz.
Reasons	<p>1) The addition of Fixed-Satellite Services in the bands 10.7-10.95 and 11.2-11.45 GHz is to provide a contiguous 1,000 MHz wide fixed-satellite downlink between 10.7 and 11.7 GHz.</p> <p>2) ADD 404B is to provide protection to the passive <del>sensor</del> service.</p>

## GHz

11.7-12.5	11.7-12.2	11.7-12.2
FIXED	<del>FIXED</del>	FIXED
MOBILE except aero-nautical mobile	FIXED-SATELLITE (Space-to-Earth)	MOBILE except aeronautical mobile
BROADCASTING	<del>MOBILE except aero-nautical mobile</del>	BROADCASTING
BROADCASTING-SATELLITE	BROADCASTING-SATELLITE	BROADCASTING-SATELLITE
	BROADCASTING	
	405BB 405BC	405BA
	12.2-12.5	12.2-12.5
	FIXED	FIXED
	MOBILE <del>except</del> aero-nautical mobile	MOBILE except aeronautical mobile
	BROADCASTING	BROADCASTING
	BROADCASTING-SATELLITE	
405BA	405BCA 405BF	

SUP 405BB Spa2	<del>Terrestrial radiocommunication services in the band 11.7-12.2 GHz in Region 2 shall be introduced only after the elaboration and approval of plans for the space radiocommunication services, so as to ensure compatibility between the uses that each country decides for this band.</del>
ADD 405BCA	<u>The use of the band 12.2-12.5 GHz in Region 2 by the Broadcasting-Satellite service is limited to domestic systems and is subject to previous agreements between the administrations concerned and those having services operating in accordance with the Table, which may be affected (see Article 9A and Resolution No. Spa 2-3)</u>
ADD 405BF	<u>New satellite and terrestrial radiocommunication systems in the band 12.2-12.5 GHz in Region 2 shall not be introduced until after the 1982 Regional Administrative Radio Conference.</u>
<u>Reasons</u>	<p>1) The suppression of 405BB is consequential to the proposed deletion of all terrestrial services in the 11.7-12.2 GHz band.</p> <p>2) The changes to the allocations in the Table between 11.7 and 12.5 GHz and the associated ADD 405BCA and ADD 405BF are to provide the flexibility for the 1982 RARC to fixed satellites and broadcasting satellites in planning for the space service and to provide for the requirements of the Broadcasting-Satellite Service.</p>

GHz

Region 1	Region 2	Region 3
12.75-13.25	<p>FIXED</p> <p>MOBILE</p> <p><u>FIXED-SATELLITE (Earth-to-Space)</u></p>	
<u>Reason</u>	<p>To provide more bandwidth for fixed-satellite earth-to-space transmission as a complement to the proposed expansion of the <del>Fixed-Satellite</del> and <del>Broadcasting-Satellite</del> Services (space-to-earth) in the bands 10.7-12.5 GHz.</p>	

GHz

13.4-14.0	<p>RADIOLOCATION</p> <p><u>345A</u> 407 407A 408 409</p>
<u>Reason</u>	<p>See under the band 1215-1300 MHz for ADD 345A re radar operation in the Earth Exploration (Active Sensor) and the Earth Exploration-Satellite (Active Sensor) Services.</p>

GHz

14.4-14.5	<p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-Space)</p> <p>MOBILE</p> <p>408B <u>408C</u></p>
14.5-15.35	<p>FIXED</p> <p>MOBILE</p> <p>408B <u>408C</u></p>
MOD <u>408C</u>	<p>Radio astronomy observations on the formaldehyde line (rest frequency 14.489 GHz) are being carried out in a number of countries under national arrangements. In making assignments to <del>stations-in-the-fixed-and-mobile</del> <u>other</u> services, administrations are urged to take all practicable steps to protect radio astronomy observations from harmful interference, particularly from airborne or space borne transmitters, in the band <u>14.485-14.515-14.473.-14.503</u> GHz.</p>

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<u>Reason</u>	To emphasize the radio astronomy need for protection from transmitters operating from aircraft and spacecraft and to centre the protected band on the line frequency.
15.35-15.4	RADIO ASTRONOMY <u>EARTH EXPLORATION (Passive Sensor)</u> <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> 409C <u>412J</u>
15.4- <del>15.7</del> <u>15.45</u>	<u>RADIO ASTRONOMY</u> <u>EARTH EXPLORATION (Passive Sensor)</u> <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> <u>AERONAUTICAL-RADIONAVIGATION</u> 352A 352B 407 <u>412J</u>
<u>15.45-15.7</u>	AERONAUTICAL RADIONAVIGATION <u>352A 352B 383B 407 408D</u>
15.7- <del>17.7</del> <u>15.75</u>	<u>RADIOLOCATION</u> <u>AERONAUTICAL RADIONAVIGATION</u> <u>352A 352B 383B 407 408 408D</u>
<del>15.7</del> <u>15.75-17.0</u>	RADIOLOCATION <u>407 408 409CA</u>
<u>17.0-17.5</u>	<u>RADIOLOCATION</u> <u>FIXED-SATELLITE (Earth-to-Space)</u> <u>Radio location</u> 407 408

17.5-17.7

RADIOLOCATION

407 408

Note: Re MOD 352A and 352B, refer to the band 1570-1624 MHz.

ADD 408D

In the future planning of this band administrations are urged to give all practicable protection to radio astronomy from out of band transmissions by assigning frequencies for earth-based transmitters in the lower portion of the band and frequencies for airborne transmitters in the upper portion of the band.

ADD 409CA

The area of the spectrum 15.75 to 16.20 GHz may also be used for Airport Surface Detection Equipment (ASDE).

Reasons

- 1) The existing allocation for radio astronomy is too narrow. In addition, a more efficient use of the radio spectrum is achieved if airborne transmissions do not occur in bands immediately adjacent to those allocated to radio astronomy. There is also a need to provide spectrum for passive sensors compatible with radio astronomy spectrum usage.
- 2) The proposed allocation to Aeronautical Radionavigation in the 15.7-15.75 GHz band is to offset the loss of spectrum to this service in the band 15.4-15.45 GHz.
- 3) To provide more bandwidth for Fixed-Satellite earth-to-space transmission as a complement to the increased fixed-satellite and broadcasting satellite space-to-earth bandwidth in the 10.7-12.5 GHz interval. The change is made tentatively as close as possible to 17.7 GHz, taking note of possible interference between satellite systems using this band and the 17.7-21.2 GHz space-to-earth Fixed-Satellite band. Further study will be required to establish how close this can be done.
- 4) Re 412J refer to the band 1400-1427 MHz.

Region 1	Region 2	Region 3
17.7-17.9	FIXED FIXED-SATELLITE (Space-to-Earth) MOBILE <u>except aeronautical mobile</u> <u>Earth Exploration-Satellite (Passive Sensor)</u> <u>Earth Exploration (Passive Sensor)</u>	
19.7-19.9	FIXED-SATELLITE (Space-to-Earth) <u>Earth Exploration-Satellite (Passive Sensor)</u> <u>Earth Exploration (Passive Sensor)</u> 409E	
<u>22.21-22.5</u>	FIXED MOBILE <u>except aeronautical mobile</u> <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> <u>EARTH EXPLORATION (Passive Sensor)</u> 410A	
<u>22.5-22.55</u>	FIXED MOBILE	<u>22.5-22.55</u> FIXED MOBILE BROADCASTING-SATELLITE 410B
<u>22.55-23</u>	FIXED MOBILE <u>INTER-SATELLITE</u>	<u>22.55-23</u> FIXED MOBILE BROADCASTING-SATELLITE 410B <u>INTER-SATELLITE</u>
<u>23-23.55</u>	FIXED MOBILE <u>INTER-SATELLITE</u>	

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GHz

23.55-23.6		
FIXED MOBILE		
23.6-24.0		
RADIO ASTRONOMY <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> <u>EARTH EXPLORATION (Passive Sensor)</u> 407 <u>412J</u>		
24.25-25.25		
RADIONAVIGATION <del>411</del> 412		
31-31.3		
FIXED MOBILE <i>Space Research</i> 412H <del>412I</del>		
31.3-31.5		
RADIO-ASTRONOMY <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> <u>EARTH EXPLORATION (Passive Sensor)</u> 412A <u>412J</u>		
31.5-31.8 SPACE RESEARCH <u>(Passive)</u> <u>EARTH EXPLORATION-SATELLITE</u> <u>(Passive Sensor)</u> <u>EARTH EXPLORATION</u> <u>(Passive Sensor)</u>  <i>Fixed</i> <i>Mobile</i>	31.5-31.8 SPACE RESEARCH <u>(Passive)</u> <u>EARTH EXPLORATION-SATELLITE</u> <u>(Passive Sensor)</u> <u>EARTH EXPLORATION</u> <u>(Passive Sensor)</u>  <u>412J</u> 405C	31.5-31.8 SPACE RESEARCH <u>(Passive)</u> <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> <u>EARTH EXPLORATION</u> <u>(Passive Sensor)</u> <i>Fixed</i> <i>Mobile</i>
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GHz

31.8-32.3	RADIONAVIGATION <u>INTER-SATELLITE</u> <i>Space Research</i> 412B <u>412BA</u>
32.3- <u>32.8</u>	RADIONAVIGATION <u>INTER-SATELLITE</u> <u>412BA</u>
<u>32.8</u> -33	RADIONAVIGATION
34.2-35.2	RADIOLOCATION <i>Space Research</i> <u>EARTH EXPLORATION-SATELLITE (Active Sensor)</u> <u>EARTH EXPLORATION (Active Sensor)</u> 407 408 412 412C <del>412D</del>
36- <u>36.5</u> 40	FIXED MOBILE <del>391A-</del>
<u>36.5</u> -37.5	FIXED MOBILE <u>except aeronautical mobile</u> <u>RADIO ASTRONOMY</u> <del>412E</del>
<u>37.5</u> -38.5	FIXED MOBILE

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.../144



Reasons22.0-22.21 GHz

The difficulty involved in sharing with radio astronomy as provided for under footnote 410A makes it necessary to limit the mobile service to transmitters on the earth's surface in the bands 22-22.21 GHz and 22.21-22.5 GHz. These changes in band limits are consequential to this proposal.

17.7-17.9 GHz, 19.7-19.9 GHz22.21-22.5 GHz, 23.6-24 GHz

These several proposals are designed to specify, along with presently existing allocations and other proposals, a suitably distributed series of allocations to the Earth Exploration Services for the passive remote sensing of earth surface and atmospheric constituents and parameters. In combination, these bands provide the spread of frequencies for the operation of Multifrequency Radiometers in the measurement of water salinity, sea ice, snow and ice morphology, soil moisture, cloud, rain, and water vapour. The multitude of bands is needed to estimate the separate radiant sources where the individual spectra are broad and overlapping.

22.55 to 32.8 GHz

In these bands where the Inter-satellite service has been proposed; this would provide a 1 GHz wide go and return band for radiocommunication between geostationary satellites. The band edges of the 22.55-23.55 GHz allocation were chosen to minimize interference into radio astronomy systems.

34.2-35.2 GHz

This band and lower frequency bands, will be used to measure meteorological properties of rain clouds. Cloud height, temperature profile and water contents are determined by multifrequency radars.

36.5-37.5 GHz

To provide for the wider bandwidth required by the Radio Astronomy service than that available in the 31.3-31.5 GHz band.

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<u>Reason for</u> MOD 391A	Refer to this MOD under the band 5750-5770 MHz where the mention of 36.458-36.488 GHz has been deleted.
SUP 411-	In the band 24.25-25.25 GHz ground based radionavigation aids are not permitted except where they operate in cooperation with airborne or shipborne radionavigation devices.
ADD 412BA	<u>In the planning of systems for the inter-satellite and radionavigation services in the band 31.8 to 32.8 GHz administrations shall take all measures to prevent harmful interference between these two services, which would otherwise result in restricting the operation of the radionavigation service.</u>
SUP 412D	<del>The band 34.4-34.5 GHz may be used by weather radar devices on meteorological satellites for the detection of clouds.</del>
SUP 412E	<del>In Bulgaria, Cuba, Hungary, Poland, Yugoslavia, Roumania, Czechoslovakia and the U.S.S.R., the band 36.5-37.5 GHz is also allocated to the radio astronomy service.</del>
SUP 412F	<del>Radio astronomy observations in the band 31.2-31.3 GHz are carried out in a number of countries under national arrangements. Administrations are urged to take all practicable steps to protect radio astronomy observations in this band from harmful interference.</del>
<u>Reason for</u> MOD 412J	Refer to the band 1400-1427 MHz.
<u>Reasons</u>	<p>1) ADD 412BA</p> <p>To take into account the safety-of-life nature of the Radionavigation Service in considering the sharing of the 31.8-32.8 GHz band by the two primary services allocated to the band.</p>

2) SUP ~~411~~

The footnote could result in excessive restrictions on the service and, in particular, on the operation of Airport Surface Detection Equipment (ASDE).

3) - SUP 412D, SUP 412E and SUP 412I are consequential to the above proposals.

GHz

Region 1	Region 2	Region 3
38.5-40	FIXED MOBILE <u>FIXED-SATELLITE (Space-to-Earth)</u>	
40-41	FIXED-SATELLITE (Space-to-Earth) <u>FIXED</u> <u>MOBILE</u>	
<u>Reason</u>	These bands are required for provide for future terrestrial and space systems noting that the overall band 38.5-41 GHz available to the Fixed-Satellite Service might be used in association with the proposed Fixed-Satellite allocation at 47.5-50 GHz.	

41-43	BROADCASTING-SATELLITE <u>412L</u>	
ADD <u>412L</u>	<u>Among more than 400 molecular lines which have been observed in interstellar space, radio astronomers have identified a few as having major importance. Those not specifically covered elsewhere in the Allocation Table are SiO at 42.82 and 43.12 GHz, CS at 48.99, 97.98 and 146.97 GHz, H<sub>2</sub>CO at 140.84 GHz and CO at 219.56 and 220.40 GHz. Observations of these spectral lines are being carried out in a number of countries under national arrangements. Administrations are urged to give all practicable protection to radio astronomy observations in the bands 42.78-42.86 GHz, 43.08-43.16 GHz, 48.94-49.04 GHz, 97.88-98.08 GHz, 140.70-140.98 GHz, 146.82-147.11 GHz, 219.34-219.78 GHz and 220.18-220.62 GHz.</u>	
<u>Reason</u>	To provide protection to the Radio Astronomy Service to the extent practicable.	

GHz

Region 1	Region 2	Region 3
43-47.5	AERONAUTICAL MOBILE-SATELLITE MARITIME MOBILE-SATELLITE AERONAUTICAL RADIONAVIGATION-SATELLITE MARITIME RADIONAVIGATION-SATELLITE <u>AERONAUTICAL MOBILE</u> <u>MARITIME MOBILE</u> <u>AERONAUTICAL RADIONAVIGATION</u> <u>MARITIME RADIONAVIGATION</u> <u>412L</u>	
47.5-48	AERONAUTICAL-MOBILE-SATELLITE MARITIME-MOBILE-SATELLITE AERONAUTICAL-RADIONAVIGATION-SATELLITE MARITIME-RADIONAVIGATION-SATELLITE- <u>FIXED-SATELLITE (Earth-to-Space)</u> <u>FIXED</u> <u>MOBILE</u>	
48-50	<del>(Not-Allocated)</del> <u>FIXED-SATELLITE (Earth-to-Space)</u> <u>FIXED</u> <u>MOBILE</u> <u>Amateur</u>	
<hr/>		
Reason	1) To provide additional spectrum for the Maritime and Aeronautical Mobile and the Radionavigation Services in the band 43-47.5 GHz. The bands 47.5 to 50 GHz are required to provide additional spectrum for the long-term for the Amateur, Fixed Satellite, the Fixed and Mobile Services noting that the Fixed Satellite allocation proposed above might be used in association with the 38.5-41 GHz band.  2) Re ADD 412L refer to the band 41-43 GHz	



Region 1	Region 2	Region 3
50-51	<u>FIXED-SATELLITE (Earth-to-Space)</u> <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> <u>EARTH EXPLORATION (Passive Sensor)</u> <u>412J</u>	
51-52	<u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> <u>SPACE RESEARCH (Passive)</u> <u>EARTH EXPLORATION (Passive Sensor)</u> <u>412J</u>	
52-54.25	<u>SPACE RESEARCH (Passive)</u> <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> <u>EARTH EXPLORATION (Passive Sensor)</u> <u>412J</u>	
54.25-58.2	<u>[INTER-SATELLITE]</u> <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> <u>EARTH EXPLORATION (Passive Sensor)</u> <u>[FIXED]</u> <u>[412J]</u>	
58.2-59	<u>SPACE RESEARCH (Passive)</u> <u>EARTH EXPLORATION-SATELLITE (Passive Sensor)</u> <u>EARTH EXPLORATION (Passive Sensor)</u> <u>412J</u>	
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<u>Reason</u>	<p>There are some 14 spectral regions distributed more or less uniformly over the band 50-59 GHz which are uniquely associated with molecular resonances of Oxygen. A majority and perhaps all of these areas are being and will be exploited for the measurement of temperature profiles in the earth's surface. These profiles are a critical operational input into weather prediction models. There is now no way to predict which subset of these regions will be sufficient to meet minimum objectives. For the next 25 years this entire band, with a minor exception, should be protected from radio frequency emissions to permit unhampered development and operational use of these passive sounding systems.</p> <p>For MOD 412J refer to the band 1400-1427 MHz.</p>
<u>Note:</u>	<p>The compatibility of the services indicated by brackets in the band 54.25-58.2 GHz are still under study.</p>

GHz

59-64	<p>INTER-SATELLITE</p> <p><u>FIXED</u></p>
<u>Reason</u>	<p>Parallel terrestrial very short haul systems can be accommodated without adverse effects on the Inter-Satellite Service due to the absorption characteristics in this area of the spectrum.</p>

GHz

71-73	<p><del>(Not-Allocated)</del></p> <p><u>EARTH EXPLORATION (Active)</u></p> <p><u>EARTH EXPLORATION-SATELLITE (Active)</u></p>
<u>Reason</u>	<p>To provide spectrum for active sensors.</p>

GHz

Region 1	Region 2	Region 3
<u>73-74</u>	<del>(Not-Allocated)</del> <u>AMATEUR-SATELLITE</u> <u>AMATEUR</u>	
<u>74-84</u>	<del>(Not-Allocated)</del> <u>FIXED-SATELLITE</u> <u>FIXED</u> <u>MOBILE</u> <u>Amateur</u>	
<u>Reason</u>	The allocations proposed above are required to provide for future systems in the services indicated.	

GHz

<u>92-95</u>	<del>FIXED-SATELLITE (Earth-to-Space)</del> <u>FIXED</u> <u>MOBILE</u>
<u>95-101 100</u>	AERONAUTICAL MOBILE-SATELLITE MARITIME MOBILE-SATELLITE AERONAUTICAL RADIONAVIGATION-SATELLITE MARITIME RADIONAVIGATION-SATELLITE <u>AERONAUTICAL MOBILE</u> <u>MARITIME MOBILE</u> <u>AERONAUTICAL RADIONAVIGATION</u> <u>MARITIME RADIONAVIGATION</u> <u>412L</u>

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GHz

100-101

AERONAUTICAL-MOBILE-SATELLITE

MARITIME-MOBILE-SATELLITE

AERONAUTICAL-RADIONAVIGATION-SATELLITE

MARITIME-RADIONAVIGATION-SATELLITE

EARTH EXPLORATION-SATELLITE (Passive Sensor)EARTH EXPLORATION (Passive Sensor)412J101-102

SPACE RESEARCH (Passive)

EARTH EXPLORATION-SATELLITE (Passive Sensor)EARTH EXPLORATION (Passive Sensor)412J102-105FIXED-SATELLITE (~~Space-to-Earth~~)FIXEDMOBILE105-105.5

INTER-SATELLITE

FIXED-SATELLITEFIXEDMOBILEReasons

- 1) Bands 92-95 GHz 102-105 GHz and 105-105.5 GHz
- 2) The above proposed allocation are required for future systems in the services indicated above. The deletion of the sense of transmission for the Fixed-Satellite service would provide for flexibility of system design.
- 3) Band 95-100 GHz  
Consequential change to the band limits to accommodate Earth Exploration-Satellite (Passive Sensor) and Earth Exploration (Passive Sensor) in the band 100-101 GHz and also to provide bands in this area of the spectrum for the terrestrial mobile and radionavigation services indicated.
- 4) For MOD 412J refer to the band 1400-1427 MHz.

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.../153

Reasons  
cont'd

## 4) Bands 100-101 GHz and 101-102 GHz

The proposed amendments to the Table will allow the Earth Exploration Services to provide for the passive remote sensing of trace atmospheric gases through the measurement of their line spectra. Ozone and Nitrous Oxide have prominent lines in the 100-101 GHz band. Extending the use of the 101-102 GHz band to the Earth Exploration Services will provide a clear band to be used with the other two.

## 5) For ADD 412 refer to the band 41-43 GHz.

## GHz

105.5-116INTER-SATELLITERADIO ASTRONOMY412K116-130INTER-SATELLITEFIXED130-139RADIO-ASTRONOMYSPACE-RESEARCH-(Passive)FIXED-SATELLITEFIXEDMOBILE412J139-140RADIO-ASTRONOMY-SPACE RESEARCH (Passive) 412JSUP 412K  
Spa2

~~Radio-astronomy-observations-on-the-carbon-monoxide-line-at 115.271-GHz-are-carried-out-in-a-number-of-countries-under national-arrangements.--In-making-assignments-to-other-services-in-the-Table,-administrations-should-bear-in-mind-the need-to-protect-radio-astronomy-observations-from-harmful interference-in-the-band-115.16-115.38-GHz.~~

Reason

The re-allocation of the Radio Astronomy Service from the band 130-139 GHz to the band 105.5-116 GHz is necessary in order to provide protection for observations of a large number of spectral lines in the latter band thus allowing the former band to be used by the Fixed and the Fixed-Satellite Service. The addition of the Fixed Service in the 116-130 GHz band will provide a very short haul terrestrial services as outlined for the 59-64 GHz band. The suppression of 412K is consequential to this proposal.



Note: The allocation of the band 139-140 GHz is being reviewed.

## GHz

140-142

FIXED-SATELLITE (~~Earth-to-Space~~)  
412L

142-150

AERONAUTICAL MOBILE-SATELLITE  
MARITIME MOBILE-SATELLITE  
AERONAUTICAL RADIONAVIGATION-SATELLITE  
MARITIME RADIONAVIGATION-SATELLITE  
AERONAUTICAL MOBILE  
MARITIME MOBILE  
AERONAUTICAL RADIONAVIGATION  
MARITIME RADIONAVIGATION  
412L

150-152

FIXED-SATELLITE (~~Space-to-Earth~~)  
FIXED  
MOBILE

152-162

~~{Not-Allocated}~~  
FIXED-SATELLITE  
FIXED  
MOBILE

162-165

~~{Not-Allocated}~~  
AMATEUR-SATELLITE  
AMATEUR

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GHz

165-170~~(Not-Allocated)~~FIXED-SATELLITEFIXEDMOBILE170-182

INTER-SATELLITE

FIXEDReasons

1) 142-150 GHz

To provide bands in this area of the spectrum for Maritime Mobile, Aeronautical Mobile and the Aeronautical and Maritime Radionavigation Services.

2) 150-182 GHz

To provide wide-band allocation for the services indicated. No direction of transmission has been indicated for the proposed ~~fixed-satellite~~ bands in order to allow for system design flexibility.

Note:

The allocation in the band 140-142 GHz is being reviewed.

182-185

SPACE RESEARCH (Passive)

EARTH EXPLORATION-SATELLITE (Passive Sensor)EARTH EXPLORATION (Passive Sensor)412JReason

These proposed changes in allocation to Earth Exploration Services are to provide for the passive remote sensing of trace atmospheric gases through the measurement of their line spectra. Ozone and Water Vapour have prominent lines in the 182-185 GHz band.

GHz

Region 1	Region 2	Region 3
185-190	INTER-SATELLITE <u>FIXED</u>	
190-200	AERONAUTICAL MOBILE-SATELLITE MARITIME MOBILE-SATELLITE AERONAUTICAL RADIONAVIGATION-SATELLITE MARITIME RADIONAVIGATION-SATELLITE <u>AERONAUTICAL MOBILE</u> <u>MARITIME MOBILE</u> <u>AERONAUTICAL RADIONAVIGATION</u> <u>MARITIME RADIONAVIGATION</u>	
200-220	<del>{Not-Allocated}</del> <u>FIXED-SATELLITE</u> <u>FIXED</u> <u>MOBILE</u> <u>412L</u>	
220-230	<u>FIXED-SATELLITE</u> <u>FIXED</u> <u>MOBILE</u> <u>412L</u>	
230-240	RADIO ASTRONOMY SPACE RESEARCH (Passive) <u>412J</u>	
240-250	<del>{Not-Allocated}</del> <u>FIXED-SATELLITE</u> <u>FIXED</u> <u>MOBILE</u> <u>Amateur 320A</u>	

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GHz

250-265

AERONAUTICAL MOBILE-SATELLITE  
MARITIME MOBILE-SATELLITE  
AERONAUTICAL RADIONAVIGATION-SATELLITE  
MARITIME RADIONAVIGATION-SATELLITE  
AERONAUTICAL MOBILE  
MARITIME MOBILE  
AERONAUTICAL RADIONAVIGATION  
MARITIME RADIONAVIGATION

265-275

FIXED-SATELLITE  
FIXED  
MOBILE

- Reason 1) To provide wideband allocations in this area of the spectrum for the services indicated in the bands from 185 to 275 GHz. The direction of transmission for the Fixed-Satellite service was deliberately omitted in order to provide system flexibility for long range planning.
- 2) Footnote 320A would allow amateur satellite operations in the band 240-250 GHz (refer to the band 220-225 MHz).
- 3) Footnote MOD 412J refer to 1400-1427 MHz band.
- 4) For ADD 412L refer to the band 41-43 GHz.

ARTICLE 6

Special Rules for the Assignment and Use of  
Frequencies

ADD 417A

On the condition that harmful interference is not  
caused to stations of the fixed service, the fre-  
quency bands allocated for use by the fixed service  
between 1605 and 28000 kHz may also be used by sta-  
tions of the land mobile service communicating only  
within the boundary of the country in which they  
are located.

Reason

To accommodate special requirements for land mo-  
bile service in the HF band.



ARTICLE 7

Special Rules Relating to Particular Services

Section I - Broadcasting Service

ADD 423A Broadcasting stations in Band 7 shall not use a transmitter power in excess of 54 dBW for A3 or an equivalent power for other modes of emission.

ADD 423B In Band 7, no administration shall employ more than one frequency per frequency band to provide simultaneously the same program intended for reception within a specific geographical area.

ADD 423C In Band 7, broadcasting stations shall convert to the single sideband mode of emission as soon as possible.

Reason: In order to bring about more reasonable sharing of the broadcasting assignments in Band 7, it is necessary to limit transmitter power and repetitive programming on a number of assignments simultaneously. Also, as has been done by almost all other services in Band 7, the broadcasting service should begin using the single sideband mode of emission in order to make more efficient use of the radio spectrum..

### Section III. Aeronautical Radiobeacons

MOD 433 § 7. (1) The assignment of frequencies to aeronautical radio-beacons operating in the bands between 160 and 415 kHz shall be based on a protection ratio against interference of at least 10 15 dB for each beacon throughout its service area.

Reason To provide additional protection and to conform with ICAO practices.

### Section V. Maritime Radiobeacons

MOD 458 §14. (1) The protection ratio required for a maximum radiobeacons operating in the bands between 285 and 325 kHz is based on the radiated power being kept to the value necessary to give the desired field strength at the service range. shall be at least 20dB throughout its service area.

Reason To provide for world-wide consistency in the protection ratio applicable to marine radiobeacons.

MOD 459 ~~{2} The daylight service range of the radiobeacons referred to in No. 458 shall be based on the following field strengths~~

The radiated beacon power shall be adjusted to produce a measured field strength at the limits of its daylight service range based on the following values:

Reason The service range is an operational parameter depending upon jurisdiction. Nos 458 and 459 provide parameters for determining grade of service and inter-beacon separation.

### Section VI. Fixed and Land Mobile Services

MOD 465 §15. (1) ~~Administrations are urged to discontinue, in the fixed service, the use of double sideband radiotelephone transmissions in the bands below 30 MHz, if possible as from January 1, 1970.~~

The use of double sideband radio transmissions in the bands below 30 MHz shall be terminated by January 1, 1983.

Reason In the Fixed Services below 30 MHz, SSB is practical and, from a spectrum efficiency viewpoint, desirable. Given the present urgings by the ITU, it is likely that the above proposal will cause little hardship internationally in the Fixed Service. In the Land Mobile Service DSB is being increasingly phased out.

Note: In Canada, Telecommunications Regulation Circular-1 requires all Fixed and Land Mobile installations of DSB from 1.6-30 MHz to be replaced by SSB by April 1, 1977.

Section VII.

Terrestrial Radiocommunication  
Services sharing Frequency Bands  
with Space Radiocommunication  
Services above 1 GHz

Power Limits

NOC 470B - 470BA

- ADD 470BB (1B) Where new radio-relay systems are built on existing routes<sup>2</sup>, the maximum values of equivalent isotropically radiated power shall not, as far as possible, exceed for each transmitter;
- +47 dBW for any antenna beam directed within 0.5° of any location in the geostationary satellite orbit which has been notified to the International Frequency Registration Board, or if practicable the geostationary satellite orbit;
- +47 to +55 dBW, on a linear decibel scale (8 dB per angular degree) for any antenna beam directed between 0.5° and 1.5° of any location in the geostationary satellite orbit which has been notified to the International Frequency Registration Board, or if practicable the geostationary satellite orbit.
- 
- ADD 470BB.1 <sup>2</sup> An existing route is regarded as one already planned before 1 July 1966, and brought into service before 1 January, 1973.
- ADD 470BB.2 <sup>3</sup> The operation of a radio relay station established on an existing route and exceeding the limits given in 470BB may, in view of the characteristics of the terrestrial and space systems involved, result in objectionable levels of interference to a space station on a geostationary satellite whose position has been notified after the radio-relay station has been brought into service; in such a case, the action to be taken with regard to both systems to reduce interference to a level which can be agreed by the Administrations concerned shall be determined by consultation between those Administrations.

Reason:

To promote the intent of the existing CCIR Recommendation 406-3 which protects the geostationary satellite orbit without imposing undue hardship on line-of-sight radio relay systems which share the same frequency band.

NOC 470C - 470CA

MOD 470D (3) The limits given in Nos. 470AA, 470B, 470BA and 470C apply in the following frequency bands allocated to the fixed-satellite service, the auxiliary - satellite service and the meteorological-satellite service for reception by space stations, where these bands are shared with equal rights with the fixed or mobile service:

2655 - 2690 MHz ~~(for Regions 2 and 3)~~

4400 - 4700 MHz

5800 - 5850 MHz (for the countries mentioned in No. 390)

5825 - 5850 MHz (for the countries mentioned in No. 389)

5850 - 5925 MHz (for Regions 1 and 3)

5925 - 6425 MHz

6425 - 6525 MHz

6525 - 6625 MHz

6625 - 6925 MHz

7900 - 7975 MHz

7975 - 8025 MHz (for the countries mentioned in No. 392H)

8025 - 8400 MHz

MOD 470DA (4) The limits given in Nos. 470AB, 470B and 470CA apply in the following frequency bands allocated to the fixed-satellite service for reception by space stations, where these bands are shared with equal rights with the fixed or mobile service:

10.95 - 11.20 GHz (for Region 1)

12.50 - 12.75 GHz (Regions 1 and 2)

12.75 - 13.25 GHz

14.175 - 14.300 GHz (for the countries mentioned in No. 407)

14.4 - 14.5 GHz

MOD 470DB (5) The limits given in Nos. 470B and 470CA apply in the following frequency bands allocated to the fixed-satellite service and the auxiliary-satellite service for reception by space stations, where these bands are shared with equal rights with the fixed or mobile service:

17.0 - 17.5 GHz (for the countries mentioned in  
No. 407 and 408)

27.5 - 29.5 GHz

29.5 - 31.0 GHz (for the country mentioned in  
No. 409E)

Reason

MOD 470D, MOD 470DA, MOD 470DB

To bring the Auxiliary-Satellite Service within the same provisions as those applicable to the Fixed-Satellite Service.



Spa 2

Section VIII. Space Radiocommunication

Services sharing Frequency Bands

with Terrestrial Radiocommunication

Services above 1 GHz

NOC 470E - 470I

MOD 470J (3A) The limits given in No. 470G apply in the following frequency bands allocated to transmission by earth stations in the fixed-satellite service, the auxiliary-satellite service, the mobile-satellite service, and earth exploration-satellite service, ~~and-in-parti-  
cular-the-meteorological-satellite-service~~ where these bands are shared with equal rights with the fixed or mobile service:

2655 - 2690 MHz ~~(Regions-2-and-3)~~

4400 - 4700 MHz

5800 - 5850 MHz (for the countries mentioned in  
No. 390)

5825 - 5850 MHz (for the countries mentioned in  
No. 389)

5850 - 5925 MHz (Region 1 and 3)

5925 - 6425 MHz

6425 - 6525 MHz

6525 - 6625 MHz

6625 - 6925 MHz

7900 - 7975 MHz

7975 - 8025 MHz (for the countries mentioned in  
No. 392H)

8025 - 8400 MHz

10.95 - 11.20 GHz (Region 1)

12.50 - 12.75 GHz (Regions 2 and 3 and for the  
countries mentioned in No. 405BD)

12.75 - 13.25 GHz

14.175 - 14.300 GHz (for the countries mentioned in  
No. 407)

14.4 - 14.5 GHz

MOD 470JA (3B) The limits given in No. 470GA apply in the following frequency band allocated to transmission by earth stations in the fixed-satellite service, where this is shared with equal rights with the fixed or mobile service:

17.0 - 17.5 GHz (for the countries mentioned in  
No. 407 and 408)

27.5 - 29.5 GHz

Reason: Modifications are consequential to the Article 5 changes.

NOC 470K - 470M

Spa2 Limits of Power Flux Density from Space Stations

- NOC 470N § 23.(1) Power flux density limits between 1690 MHz and 1700 MHz
- NOC 470NA - 470NC
- NOC 470ND (2) Power flux density limits between 1670 MHz and 2535 MHz
- NOC 470NE
- MOD 470NF (b) The limits given in No. 470NE apply in the frequency bands listed in No. 470NG which are allocated to transmission by space stations in the following space radiocommunication services:
- Earth exploration-satellite service and in particular meteorological-satellite service (space-to-Earth)
  - space research service (space-to-Earth)
  - fixed satellite service (space-to-Earth)
  - auxiliary-satellite service (space-to-Earth)
- where these bands are shared with equal rights with the fixed or mobile service:
- NOC 470NG - 470NGA
- NOC 470NH (3) Power flux density limits between 2500 MHz and 2690 MHz.
- NOC 470NI - 470NK
- NOC 470NL (4) Power flux density limits between 3400 MHz and 7750 MHz.
- NOC 470NM
- MOD 470NN (b) The limits given in No. 470NM apply in the frequency bands listed in No. 470NO which are allocated to transmission by space stations in the following space radiocommunication services:
- fixed-satellite service (space-to-Earth)
  - auxiliary-satellite service (space-to-Earth)
  - meteorological-satellite service (space-to-Earth)
  - mobile-satellite service (space-to-Earth)
- where these bands are shared with equal rights with the fixed or mobile service:

MOD	<u>47QNO</u>	3400-3500 MHz ( <u>for Region 1 and the countries mentioned in 376</u> ) <u>3500 - 4200 MHz</u> <u>4400 - 4700 MHz</u> 7250 - 7300 MHz (for the countries mentioned in No. 392G) 7300 - 7750 MHz
NOC	47ONP	(5) Power flux density limits between 8025 MHz and 11.7 GHz.
NOC	47ONQ - 47ONR	
MOD	47ONS	8025 - 8400 MHz 8400 - 8500 MHz <u>10.7 - 10.95 GHz</u> 10.95 - 11.20 GHz <u>11.20 - 11.45 GHz</u> 11.45 - 11.70 GHz
NOC	47ONT	(6) Power flux density limits between 12.50 GHz and 12.75 GHz.
NOC	47ONU - 47ONW	
NOC	47ONX	(7) Power flux density limits between 17.7 GHz and 22.0 GHz
NOC	47ONY - 47ONZB	

Reason: Consequential to modifications of Article 5

Note: In addition to the above proposals, the reference to passive satellite in RR47ONA, 47ONE, 470 NM, 47ONQ, 47ONU and 47ONY must be suppressed.

Section IX. Space Radiocommunication Services

- ADD 470UA Spare space stations on the geostationary satellite orbit:
- ADD 470UB - shall occupy the same notified positions on the orbit as the operational space stations which they are designed to protect; but
- ADD 470UC - need not comply with No. 470UB as long as the satellite network to which the spare space station belongs does not produce interference greater than permissible interference into any other satellite network and does not cause any difficulties to any future satellite systems complying with the provisions of Section I of Article 9A.

Reason: To promote the efficient use of the geostationary satellite orbit and the radio frequency spectrum.



- MOD Spa 2 Control of Interference between into Geostationary-Satellite ~~and-non-synchronous-inclined-Orbit-Satellite~~ Systems
- MOD 470VA Non-geostationary space stations and space stations  
 §25 normally geostationary but in transit to their notified  
 Spa2 positions, ~~in-the-fixed-satellite-service~~ shall cease or  
 reduce to a negligible level radio emissions<sup>1</sup>, and their  
 associated earth stations shall ~~not-transmit-to-them~~ cease  
 transmission whenever there is insufficient angular separation  
 between ~~the-non-geostationary~~ these satellites and geostationary  
 satellites ~~and-unacceptable~~ resulting in interference greater  
 than permissible interference to geostationary satellite space  
 systems operating in accordance with these Regulations.
- 
- SUP 470VA.1 <sup>1</sup>~~The-level-of-unacceptable-interference-shall-be-fixed-by~~  
~~agreement-between-the-administrations-concerned,-using-the~~  
~~relevant-6.6.I.R.-Recommendations-as-a-guide.~~
- ADD 470VA.1 <sup>1</sup>The use of radio emissions for telemetry, tracking, and  
 telecommand functions by these satellites shall be agreed  
 among the administrations concerned.

Reasons:

To protect geostationary satellites against interference from another geostationary satellite in a transfer orbit to its notified position. This provision would therefore apply equally to a satellite initially placed in orbit, as well as to one in transit from one nominal geostationary position to another. The modification to the title of this section is consequential. The new footnote recognizes the special problems of spacecraft telemetry, tracking, and telecommand during transfer orbit.

The deletion of the limitation to the fixed-satellite service generalizes the provision to include all non-geostationary space stations and all space stations in transit, no matter which service they operate within.

The substitution of the term "permissible interference" for "unacceptable interference" is consistent with the CCIR and the new definition 92D. This modification permits the suppression of existing 470VA.1 since by definition permissible interference is agreed between Administrations.

- NOC Spa 2 Station Keeping of Space Stations<sup>2</sup>
- NOC 470VB Space stations on geostationary satellites:  
§26.  
Spa2
- MOD 470VC  
Spa2 - shall have the capability of maintaining their position within  $\pm 0.1$  degree of the longitude of their nominal positions, ~~but efforts should be made to achieve a capability of maintaining their positions at least within  $\pm 0.5$  degree of the longitude of their nominal positions;~~
- MOD 470VD  
Spa 2 - shall maintain their positions within  $\pm 0.1$  degree of longitude of their nominal positions irrespective of the cause of variation; but
- MOD 470VE  
Spa 2 - need not comply with No. 470VD as long as the satellite network to which the space station belongs does not produce ~~an unacceptable level of~~ interference greater than permissible interference<sup>1</sup> into any other satellite network whose space station complies with the limits given in No. 470VD.

---

SUP 470VE.1<sup>1</sup>  
Spa 2 ~~The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant CCIR Recommendations as a guide.~~

Reasons:

To promote more efficient orbit-spectrum utilization, it is necessary to maintain a closer satellite station-keeping tolerance of  $\pm 0.1$  degree in longitude. The benefits of tighter station-keeping have been shown in the CCIR and the achieved station-keeping **performance** of several operational satellites has shown the practicality of achieving these new limits. The possible need for less stringent station-keeping tolerance in the case of experimental or other short-life satellites will be satisfied by the provisions of MOD 470VE.

Precedent for tighter station-keeping has been set at the WARC-BS(77) where a tighter tolerance of  $\pm 0.1^\circ$  was found necessary.

The substitution of the term "permissible interference" for "unacceptable interference" is consistent with the CCIR and the new definition 92D. This modification permits the suppression of existing 470VA.1 since by definition permissible interference is agreed between Administrations.

MOD 470VF § 27. The pointing direction of maximum radiation of any earth-ward beam of antennae on geostationary satellites shall be capable of being maintained within:

10% of the half power beamwidth relative to the nominal pointing direction, or

0.5 degree relative to the nominal pointing direction,

whichever is greater. This provision applies only when such a beam is intended for less than global coverage.

In the event that the beam is not rotationally symmetrical about the axis of maximum radiation, the tolerance in any plane containing this axis shall be related to the half power beamwidth in that plane.

This accuracy shall be maintained only if it is required to avoid ~~unacceptable~~ interference<sup>2</sup> greater than permissible interference to other systems.

Reason

Consequential to ADD 92D. It is noted that the Final Acts of the 1977 BC WARC (Annex 8, Para 3.14) have more stringent pointing criteria for the Broadcasting-Satellite Service and this aspect will be reviewed later.

SUP 470VF.1  
Spa2

~~<sup>2</sup> The level of unacceptable interference shall be fixed by agreement between the administrations concerned, using the relevant GGIR Recommendations as a guide.~~

ADD

The Use of Passive Satellites

ADD 470VH

The transmission of radiocommunication signals by reflection from a space station other than for radiodetermination purposes shall be permitted only for experimental or scientific purposes and subject to agreement between the administrations concerned. These transmissions shall be such as to produce interference not greater than permissible to services operating in accordance with the Radio Regulations.

Reason

Consequential to SUP 84BAD and SUP 392D.

CHAPTER III

Notification and Registration of Frequencies -  
International Frequency Registration Board

ARTICLE 8

General Provisions

NOC 471

472 § 2. The functions of the Board shall include:

MOD 473

- a) the processing of frequency assignment notices received from administrations for recording in the Master International Frequency Register with a view to ensuring, as appropriate, formal international recognition thereof and in the same conditions and for the same purpose the orderly recording of orbital positions assigned by countries to geostationary satellites;

Reason: As per intent of Article 10, paras 65 a) and 66 b) of ITU Convention, Malaga - Torremolinos, 1973.

NOC 474 to 485



ARTICLE 9

Notification and Recording in the Master International Frequency  
Register of Frequency Assignments<sup>1</sup> to Terrestrial  
Radiocommunication Stations<sup>2</sup>

MOD 486 § 1. (1) Any frequency assignment<sup>3</sup> to a fixed, land, broad-  
Spa2 casting<sup>4</sup>, radionavigation land, radiolocation land or standard  
frequency station, or to a ground-based station in the meteor-  
ological aids service, shall be notified to the International  
Frequency Registration Board:

- a) if the use of the frequency concerned is capable  
of causing harmful interference to any service  
of another administration<sup>5</sup>; or
- b) if the frequency is to be used for international  
radiocommunication; or
- c) if it is desired to obtain international recogni-  
tion of the use of the frequency<sup>5</sup>; and

ADD 486A by the Administration of the country on whose territory the  
station is located unless the countries concerned have con-  
cluded a special arrangement in accordance with Article 31  
of the Convention and advised the Union accordingly.

Reason: Consequential to the suppression of Resolution No. 5.

NOC 487

MOD 488 (3) Specific frequencies prescribed by these Regulations  
for common use by stations of a given service ~~{for example,  
international-distress-frequencies-500-ke/s-and-2182-ke/s;  
frequencies-of-ship-radiotelegraph-stations-operating-in-their  
exclusive-high-frequency-bands,-etc-}~~, which are listed in  
Appendix XX, shall not be notified to the Board.

Reason: It is proposed that a new Appendix XX containing a  
list of common frequencies used by stations of a  
given service shall not be notified to the Board.  
This Table added to the International Radio  
Regulations should serve to inform operating  
agencies that frequency assignment notification  
is not required for the frequencies described by  
the Radio Regulations for common use by stations  
of a given service that appear in this Appendix.

NOC 489 to 497



NOC 498 to 499

MOD Spa 2 Sub-Section IIA. Procedure to be followed ~~in cases not covered by~~ for the examination of notices except for those referred to in Nos. 541, 547, 552, 561, 568 and Sub-Section IIB of this Article.

MOD 500 § 9. (1) ~~Except for notices referred to in Nos. 541, 547, 552, 561 and 568,~~ The Board shall examine each notice with respect to

Reason: All exceptions are combined in one statement. This makes for an easier interpretation of the intent of Sub-Section IIA.

NOC 501 to 540

MOD 541 § 19. (1) Examination of Notices concerning Frequency Assign-  
Mar2 ments to Coast Radiotelephone stations in the Bands allocated exclusively to the Maritime Mobile Service between 4 000 and 23 000 kHz for Coast Radiotelephone Stations ~~(see No. 500)~~<sup>1</sup>.

Reason: Consequential to modified title for Sub-Section IIA and No. 500 and also note 1 becomes redundant in 1979.

SUP 541.1 <sup>1</sup> ~~See paragraph 10 of Resolution No. Mar2--12.~~  
Mar2

Reason: Revised provisions of Article 9 shall enter into force on 1 January 1978. In 1979 this Regulation becomes redundant.

NOC 542 to 544

- MOD 545 (5) In the case of a notice which has received a  
Mar2 favourable finding with respect to No. 542A but unfavour-  
able with respect to No. 542B, the Board shall examine this  
notice with respect to the probability of harmful inter-  
ference to the service rendered by a coast radiotelephone  
~~coast~~ station for which a frequency assignment:
- a) is in conformity with an allotment in the  
Allotment Plan and is already recorded in the  
Master Register or may be so recorded in the  
future; or
  - b) was recorded in the Master Register on a frequency  
specified in Appendix 17 Rev., as a result of a  
favourable finding with respect to No. 545; or
  - c) was recorded in the Master Register on a frequency  
specified in Appendix 17 Rev., after an unfavour-  
able finding with respect to No. 545, but has not,  
in fact, caused harmful interference to any  
frequency assignment to a coast radiotelephone  
station previously recorded in the Master Register.
- Reason: For consistency with new terminology of subtitle  
in No. 541 and other Regulations as a result of  
decisions taken at WARC MM 1974.
- NOC 546
- MOD 547 § 20. (1) Examination of Notices concerning Frequencies used  
Mar2 for Reception by Coast Radiotelephone Stations in the Bands  
allocated exclusively to the Maritime Mobile Service between  
4 000 and 23 000 kHz for Ship Radiotelephone Stations (see  
Nos. 487 and-500).<sup>1</sup>
- Reason: Consequential to modified title for Sub-Section  
IIA and No. 500 and also note 1 (547.1 Mar2)  
becomes redundant in 1979.
- SUP 547.1 <sup>1</sup> See-paragraph-10-of-Resolution-No-1-Mar2---12-  
Mar2
- Reason: Revised provisions of Article 9 shall enter  
into force on 1 January 1978. In 1979 this  
Regulation becomes redundant.

NOC 548 to 548B

MOD 549 (3) Any frequency assignment for reception by a coast  
Mar2 radiotelephone station for which the finding is favourable  
with respect to Nos. 548A and 548B shall be recorded in the  
Master Register. The date to be entered in Column 2a shall  
be that determined according to the relevant provisions of  
Section III of ~~the-present~~ this Article.

Reason: Editorial

NOC 549A to 550

MOD 551 (5) Any assignment of a frequency for reception by a  
Mar2 coast radiotelephone station which has received a favourable  
finding with respect to No. 548A but unfavourable with respect  
to No. 548B shall be recorded in the Master Register. The  
date to be entered in Column 2b shall be that determined  
according to the relevant provisions of Section III of ~~the~~  
present this Article.

Reason: Editorial

MOD 552 § 21. (1) Examination of Notices concerning Frequency Assign-  
ments to Aeronautical Stations in the Aeronautical Mobile (R)  
Service in the Bands allocated exclusively to that Service  
between 2 850 and ~~17-970-kc/s~~ 22 000 kHz (~~see-Not-500~~).

Reason: Consequential to Canadian proposals for the 1978  
World Administrative Radio Conference Aeronautical  
Mobile (R) Service and also to the modified title  
for Sub-Section IIA and No. 500.

NOC 553 to 560

MOD 561 § 22. (1) Examination of Notices concerning Frequency Assign-  
ments to Aeronautical Stations in the Aeronautical Mobile (OR)  
Service in the Bands allocated exclusively to that Service  
between 3 025 and 18 030 kHz (~~see-Not-500~~).

Reason: Consequential to modified title for Sub-Section  
IIA and No. 500.

NOC 562 to 567

MOD 568 § 23. (1) Frequency Assignments to Broadcasting Stations in  
the Bands allocated exclusively to the Broadcasting Service  
between 5 950 and 26 100 kHz (~~see-Not-500~~).

Reason: Consequential to modified title for Sub-Section  
IIA and No. 500.

NOC 569 to 576

577 § 27. (1) Frequency Bands allocated exclusively to the  
Mar2 Maritime Mobile Service between 4 000 and 23 000 kHz for  
Coast Radiotelephone Stations.<sup>1</sup>

Reason: Revised provisions of Article 9 shall enter into  
force 1 January 1978. In 1979 this note and  
No. 577.1 becomes redundant.

577.1 <sup>1</sup> See-paragraph-10-of-Resolution-No-12-  
Mar2

Reason: Revised provisions of Article 9 shall enter into  
force 1 January 1978. In 1979 this Regulation  
becomes redundant.

578 to 580

581 (5) For assignments to stations other than coast radio-  
telephone ~~coast~~ stations, the relevant date shall be entered  
in Column 2b (see Nos. 525, 526, 530 and 531).

Reason: Editorial.

582 § 28. (1) Frequency Bands allocated exclusively to the  
Mar2 Maritime Mobile Service between 4 000 and 23 000 kHz for  
Ship Radiotelephone Stations.<sup>2</sup>

Reason: Revised provisions of Article 9 shall enter into  
force 1 January 1978. In 1979 this note and  
No. 582.1 become redundant.

582.1 <sup>2</sup> See-paragraph-10-of-Resolution-No-12-  
Mar2

Reason: Revised provisions of Article 9 shall enter into  
force 1 January 1978. In 1979 this Regulation  
becomes redundant.

583 to 585

586 (5) For assignments other than assignments of frequencies  
for reception by coast radiotelephone ~~coast~~ stations, the  
relevant date shall be entered in Column 2b (see Nos. 525,  
526, 530 and 531).

587 § 29. (1) Frequency Bands allocated exclusively to the Maritime  
Mobile Service between 4 000 and 25 110 kHz for Ship Radio-  
telegraph ~~Ship~~ Stations (see No. 488).

588 (2) For assignments to stations other than ship radio-  
telegraph ~~ship~~ stations, the relevant date shall be entered  
in Column 2b (see Nos. 525, 526, 530 and 531).

Reason: For consistency with new terminology as a result  
of decisions taken at WARC MM 1974.

589 § 30. (1) Frequency Bands allocated exclusively to the  
Aeronautical Mobile (R) Service between 2 850 and ~~17-970~~  
22 000 kHz.

MOD 589 Reason: Consequential to Canadian Proposals for the 1978  
World Administrative Radio Conference Aeronautical  
Mobile (R) Service.

NOC 590 to 617

MOD 618 § 39. In the case where a frequency assignment has been entered in the Master Register on the insistence of the notifying administration, following an unfavourable finding with respect to Nos. 502 or 503, and where the Board finds, after having consulted the administrations concerned, that harmful interference has not, in fact, occurred, although the assignment has been in actual use, according to ~~be~~ the notified characteristics, during a period covering all the phases of a solar cycle in which the assignment could be normally used, the Board shall amend the entry in the Master Register in such a way that it shall appear in the future as if the original finding had been favourable with respect to Nos. 502 or 503.

Reason: Editorial

NOC 619 to 639



ADDITIONAL PROPOSALS FOR ARTICLE 9

(Harmful interference/permissible interference)

(The basis for these revisions is explained in the Introduction to the Technical Regulations)

ARTICLE 9

486 (1) a) change to read - - - is capable of causing harmful interference or interference in excess of what is permissible to any service of ----

492B no change proposed to reference to interference in line 8.

492C b) no change proposed to reference of interference in line 2.

492D c) no change proposed to "acceptable level of interference" as it appears in lines 3 and 4.

492E no change proposed to "level of interference" as it appears in line 4.

492FC change to read in line 3 from bottom - - - in respect of interference in excess of what would be permissible which may be caused -----

492G no change proposed to "level of interference" as it appears in line 2.

It is proposed that the term "harmful interference" be retained wherever it appears in Sub-Section IIA as sharing between terrestrial and earth stations would not be involved.

57JAB a) change to read in last line --- probability of interference in excess of what would be permissible);

570AD change to read in 2nd line down ---- the probability of interference in excess of what would be permissible to the service ---  
change in 4th line up - - - has not, in fact, caused interference in excess of what would be permissible to any frequency assignment ----

570AGB change to read in 5th line up - - - any complaint of interference, in excess of what would be permissible, having been received.

570AX change to read in line 3 down - - - probability of interference in excess of what would be permissible but ---

change to read in line 3 up - - - that no complaint of interference in excess of what would be permissible has been received shall be indicated in the Remarks Column.

570BB change to read in line 5 down - - - does not increase the probability of interference to a level in excess of what would be permissible to assignments already recorded, ---

- 570BG change to read in last line - - - absence of complaint of interference in excess of what would be permissible.
- 611 no change proposed to reference to "harmful interference" in line 1.
- 611A no change proposed to references to "harmful interference" appearing in this RR.
- 612 (1) change to read in line 5 - - - on the grounds of interference in excess of what would be permissible.
- 614 change to read in lines 3 and 4 - - - in cases where interference, in excess of what would be permissible, has been experienced, ---
- 617 change to read in lines 1 and 2 - - - regard to the probability of interference in excess of what would be permissible remains unfavourable, - - -
- 618 change to read in line 5 - - - the administrations concerned, that interference in excess of what would be permissible has not, in fact, occurred, ----
- 626 c) no change proposed to reference to "harmful interference" in line 1.
- 627 change to read in line 2 - - - these regulations, or of interference in excess of what would be permissible.
- 631 no change proposed to reference to "harmful interference".

Spa2

ARTICLE 9A

MOD (Title) Co-ordination, Notification and Recording in the Master International Frequency Register of Frequency Assignments<sup>1</sup> to Radio Astronomy and Space Radio Communication Stations except stations in the Broadcasting-Satellite Service provided for in the Final Acts of the Broadcasting-Satellite Conference (Geneva, 1977) and any subsequent Regional Conference

Reason: The exception of the Broadcasting-Satellite Service from the provisions of this Article results from decisions of the 1971 Space Conference, based on the application of the provisions of Resolution No. Spa2-3 pending the adoption and implementation of Broadcasting-Satellite plans.

NOC 1. (NOTE)

MOD 639AA § 1. (1) An administration (or one acting on behalf of  
Spa2 a group of named administrations) which intends to establish a satellite system shall, prior to the co-ordination procedure in accordance with No. 639AJ where applicable, send to the International Frequency Registration Board not earlier than five years nor later than two years before the date of bringing into service each satellite network of the planned system, the information listed in Appendix 1B.

Reason: a) To ensure that Advance Information is published at an early date to enable Administrations planning space systems to be aware of problems and to be able to reach compromise solutions before committing large sums of money.

b) To ensure that sufficient time is available to complete co-ordination and notification procedures prior to the projected date of putting into use the proposed system.

NOC 639AB to 639AH

MOD 639AI (9) An administration on behalf of which details  
Spa2 of planned satellite networks in its system have been published in accordance with the provisions of Nos. 639AA to 639AC ~~shall periodically inform the Board whether or not comments have been received and of the progress made with other Administrations in resolving any difficulties~~ shall at the end of the ninety day period mentioned in No. 639AD, as appropriate, periodically inform the Board of the progress made with other administrations in resolving any difficulties. The Board shall publish this information in a special section of its weekly circular and shall also, when the weekly circular contains such information, so inform all administrations by circular telegram.

Reason: To ensure that the Board is aware of negotiations taking place between administrations in resolving conflicts between proposed and existing space systems.

MOD 639AJ § 2. (1) Before an administration notifies to the Board  
Spa2 or brings into use any frequency assignment to a space station on a geostationary satellite or to an earth station that is to communicate with a space station on a geostationary satellite, it shall effect co-ordination of the assignment with any other administration whose assignment in the same band for a space station on a geostationary satellite or for an earth station that communicates with a space station on a geostationary satellite is recorded in the Master Register, or has been co-ordinated or is being co-ordinated under the provisions of this paragraph or where a notice containing all the basic characteristics specified in Appendix 1A for which co-ordination of the assignment was, in fact, not required under No. 639AK is in the process of being examined by the Board under Nos. 639BI to 639BR. For this purpose, the administration requesting co-ordination shall send to any other such administration the information listed in Appendix 1A.

Reason: To ensure that co-ordination takes place between an administration proposing a new planned space system and an administration which has notified proposed frequency assignments to the Board when co-ordination with other administrations was not required.

MOD 639AK  
Spa2

(2) No co-ordination under No. 639AJ is required:

- a) when the use of a new frequency assignment will cause, to any service of another administration, an increase in the noise temperature of any space station receiver or earth station receiver, or an increase in the equivalent satellite link noise temperature, as appropriate, not exceeding the predetermined increase of noise temperature calculated in accordance with the method given in Appendix 29; or
- b) when an administration proposes to change the characteristics of an existing assignment in such a way as will, in respect of any service of another administration, meet the requirements of sub-paragraph a) above, or, where this assignment has previously been co-ordinated, will cause an increase in noise temperature not exceeding the value agreed during co-ordination, or, for an existing assignment which did not previously require co-ordination and which will not produce any additional increase in noise temperature; or
- c) when an administration proposes to replace a space station which has failed to function satisfactorily or is otherwise incapable of providing the service for which it was intended, with an identical replacement space station which would occupy the same on-station position as had been notified to the Board and occupied by the space station being replaced.

Reason: b) To provide a procedure in cases where the characteristics of an existing assignment are being changed and where frequency co-ordination had not been carried out previously.

- c) When the basic characteristics of frequency assignments to be used by a replacement space station are identical to those of the original space station assignments, there would be no increase in noise temperature(s) and re-coordination should therefore not be required.



NOC 639AL to 639AQ

MOD 639AR (5) No co-ordination under No. 639AN is required when  
Spa2 an administration proposes:

- a) to bring into use an earth station, the co-ordination area of which does not include any of the territory of any other country;
- b) to change the characteristics of an existing assignment in such a way as not to increase the level of interference to or from the terrestrial radiocommunication stations of other administrations;
- c) to operate a transportable earth station or a mobile earth station. However, if the co-ordination area associated with the operation of such a transportable earth station or mobile earth station, in a frequency band referred to in No. 639AN, includes any of the territory of another country, it shall be subject to prior agreement between the administrations concerned in order to avoid harmful interference to existing terrestrial radiocommunication stations of that country. This agreement shall apply to the characteristics of the transportable earth station(s) or mobile earth station(s), or to the characteristics of a typical transportable or mobile earth station, and shall apply to a specified service area; unless otherwise stipulated in the agreement, it shall apply to any transportable or mobile earth stations in the specified service area provided that the probability of harmful interference caused by them shall not be greater than that caused by the typical earth station for which the technical characteristics appear in the notice and has or is being submitted in accordance with No. 639BD.

Reason: To give recognition to the unique nature of transportable earth station operation vis-a-vis co-ordination and notification procedures.

NOC 639AS to 639AZ

MOD 639BA § 6. (1) Any frequency assignment to an earth or space  
Spa2 station shall be notified to the Board:

- a) if the use of the frequency concerned is capable of causing harmful interference to any service of another administration; or
- b) if the frequency is to be used for international radiocommunications; or
- c) if it is desired to obtain international recognition of the use of the frequency; and

ADD 639BA bis by the Administration of the country on whose territory the earth station is located or by the Administration (or one acting on behalf of a group of named Administrations) for which the space station is to be brought into use, unless the countries concerned have concluded a special arrangement in accordance with Article 31 of the Convention and advised the Union accordingly.

Reason: Consequential to the suppression of Resolution No. 5.

NOC 639BB to 639BC

MOD 639BD (4) A notice submitted in accordance with No. 639BA  
Spa2 or 639BB and relating to a frequency assignment:

- a) to transportable earth stations or mobile earth stations in a satellite system shall include the technical characteristics either of each transportable earth station or mobile earth station, or of a typical transportable or mobile earth station, and an indication of the service area within which these stations are to be operated; or
- b) to receiving earth stations in the Broadcasting-Satellite Service, shall include the applicable information prescribed in Section C of Appendix 1A for each frequency assignment and the particulars should pertain to a typical station indicating the related service area of the associated space station.

Reason: To be consistent with the modifications to No. 639AR and

- a) to provide for transportable earth stations to be notified under this Regulation;
- b) to simplify the notification of the use of a frequency used for reception by innumerable stations of the same service in a particular service area of the satellite.

ADD 639BD bis

Individual frequency assignment notices are not required under 639BA or 639BB for a spare space station located at the same nominal position as an operational satellite on the geostationary satellite orbit when the frequencies, antennae, power outputs, antennae pointing and other technical characteristics of the spare space station are identical to those of the operational space station or are such that the permissible level of interference agreed to during the co-ordination procedures of the operational space station would not be exceeded and the position of the spare space station is maintained within the station keeping limits of the operational satellite. The Board shall be informed that a spare space station having characteristics identical to the operational space station and meeting the station keeping requirements of this regulation has been placed in geostationary orbit. The Board shall publish this information in a special section of its weekly circular.

Reason: There is a need for a procedure pertaining to cases where a spare space station is to be placed on the geostationary satellite orbit in accordance with the provisions of ADD 470UA and ADD 470UB.

MOD 639BE § 7. (1) Except as provided in (2), for any notification  
Spa2 under No. 639BA, 639BB, 639BC, or 639BD, an individual notice for each frequency assignment shall be drawn up as prescribed in Appendix 1A, the various Sections of which specify the basic characteristics to be furnished according to the case. It is recommended that the notifying administration should also supply the additional data called for in Section A of that Appendix, together with such further data as it may consider appropriate.

(2) In cases where a number of frequency assignments have identical characteristics, a collective notice may be drawn up as prescribed in Appendix 1A and (1) above to include all such similar assignments on the same notice.

Reason: To reduce repetition of similar frequency assignment notices.

Note: The Frequency Assignment Notice form shall have to be modified slightly if this proposal is adopted.

NOC 639BF to 639BH

MOD 639BI § 10. Upon receipt of a complete notice, the Board shall  
Spa2 include all of the particulars thereof, with the date of receipt, in the weekly circular referred to in No. 497, which shall contain the particulars of all such notices received since the publication of the previous circular.

Reason: To ensure that diagrams forwarded to the Board as part of a complete notice are included in the weekly circular referred to in No. 497.

NOC 639BJ to 639CQ

MOD 639CR (2) A notice relating to a radio astronomy station  
Spa2 shall not be examined by the Board with respect to Nos. 639BN, 639BO, 639BP, 639BQ and 639BR. ~~Whatever the finding, the assignment shall be recorded in the Master Register with a date in Column 2c.~~ The assignment shall be recorded in the Master Register with a date in Column 2c if it is in accordance with 639BM. The date of receipt by the Board of the notice shall be recorded in the Remarks Column.

Reason: To indicate that notices relating to radio astronomy stations should be examined by the Board with respect to their conformity to the provisions of No. 639BM of the Radio Regulations.

NOC 639CS to 639CX



MOD 639CY (3) If, within thirty days after the projected date  
Spa2 of bringing into use, the Board receives confirmation from  
the notifying administration of the date of putting into  
use, the special symbol shall be deleted from the Remarks  
Column. In the case where the Board, in the light of a  
request from the notifying administration received before  
the end of the thirty-day period, finds that exceptional  
circumstances warrant an extension of this period, the  
extension shall in no case exceed one hundred-and-fifty  
days year.

Reason: Because of the limited number of agencies with  
launching capabilities, unforeseen circumstances  
such as launch windows, weather conditions, etc.  
may result in delays of many months before an  
actual launch can take place.

NOC 639CZ to 639DO

MOD 639DP § 32. If, in connection with an inquiry by the Board under  
Spa2 No. 639DO, the notifying administration has failed to  
supply the Board within forty-five ninety days from the  
date of the inquiry with the necessary or pertinent  
information, the Board shall make suitable entries in the  
Remarks Column of the Master Register to indicate the  
situation.

Reason: In practice it has been established that forty-  
five days is insufficient time to obtain the  
necessary information from the operating agency  
and subsequent forwarding to the Board.

NOC 639DQ

MOD 639DR (2) The Board shall thereupon prepare and forward  
Spa2 to the administration concerned a report containing its  
findings and recommendations for the solution of the  
problem and such findings and recommendations shall be  
forwarded to other administrations concerned.

Reason: The proposed wording indicates in a more positive  
sense the action to be taken by the Board in such  
cases.

MOD 639DS § 34. In a case where, as a result of a study, the Board  
Spa2 ~~submits~~ has submitted to one or more administrations  
suggestions or recommendations for the solution of a  
problem, ~~and where no answer has been received from one~~  
~~or more of these administrations within a period of ninety~~  
~~days, the Board shall consider that the suggestions or~~  
~~recommendations concerned are unacceptable to the admin-~~  
~~istrations which did not answer;~~ these administrations  
shall within ninety days from the date of the Board's



MOD 639DS submission, send their comments to the Board. In cases  
Spa2 when the Board's suggestions or recommendations have been  
unacceptable to the administrations concerned, further  
efforts should be made by the Board to find an acceptable  
solution to the problem. If ~~it-was~~ the requesting  
administration ~~which-failed~~ fails to answer within this  
period, the Board shall close the study.

Reason: The proposed wording indicates in a more  
positive sense the action to be taken by  
the Board in such cases.

NOC 639DT to 639DX

ADDITIONAL PROPOSALS FOR ARTICLE 9A

(Harmful interference/missible interference)  
(The basis for these revisions is explained in  
the Introduction to the Technical Regulations)

ARTICLE 9A

- 639AD change to read in lines 2 and 3 - - - is of the opinion that interference in excess of what would be permissible, may be caused to its ---
- 639AR c) change to read in 2nd line up - - - probability of interference in excess of what would be permissible caused to them shall not be greater ---
- 639AS e) no change proposed to reference to "acceptable level of interference;" in line 3.
- 639AX a) change to read in lines 1 and 2 - - - in respect of any interference in excess of what would be permissible which may be caused ---  
b) change to read in line 2 - - - stations will not cause interference in excess of what would be permissible to the use ---
- 639BA (1) a) change to read in line 2 - - - is capable of causing interference in excess of what would be permissible to any service - - -
- 639BM a) change to read in last line - - - and the probability of interference in excess of what would be permissible.);
- 639BP d) change to read in line 2 - - - the probability of interference in excess of what would be permissible to the service ---  
change to read in line 7 - - - in fact caused interference in excess of what would be permissible to any frequency assignment ---
- 639BQ e) change to read in line 2 - - - the probability of interference in excess of what would be permissible to the service rendered ---  
change to read in lines 7 and 8 - - - in fact, caused interference in excess of what would be permissible to any frequency assignment ---
- 639BR f) change to read in line 2 - - - the probability of interference, in excess of what would be permissible, caused to the receiving earth station ---
- 639BS change to read in line 3 - - - upon the probability on interference in excess of what would be permissible to a recorded assignment ---
- 639BY change to read in 5th line up - - - any complaint of interference in excess of what would be permissible having been received.  
change to read in 2nd line up - - - of the advice that no complaint of interference in excess of what would be permissible has been received ---

- 639CL change to read in line 4 - - - assessing the probability of interference in excess of what would be permissible (extreme propagation conditions, ---
- 639CP change to read in line 3 - - - the probability of interference in excess of what would be permissible, but not sufficiently to permit ---
- change to read in 6th line up - - - without any complaint of interference in excess of what would be permissible having been received.
- change to read 3rd line up - - - that no complaint of interference in excess of what would be permissible has been received ---
- 639CU change to read in 5th line - - - the probability of interference in excess of what would be permissible to assignments already recorded, ---
- 639DD change to read in line 1 (2) If interference in excess of what would be permissible is actually caused to ---
- 639DE change to read in line 1 (3) Interference in excess of what would be permissible to the reception of any station ---
- 639DF change to read in 2nd inset - - -, but only on the grounds of actual interference in excess of what would be permissible;
- 639DJ change to read in lines 1 and 2 - - - with regard to the probability of interference in excess of what would be permissible remains unfavourable, ---

CHAPTER IV  
Measures against Interference -  
ARTICLE 12

Technical Characteristics of Equipment and Emissions

MOD 670 §3. To the maximum extent possible, amplitude modulation systems should use single sideband emissions. having The characteristics should be in accordance with the relevant CCIR Recommendations.

Reason: To clarify the text.

ARTICLE 14

Interference and Tests

Section III. Special Cases of Interference

MOD 699 §7. Administrations authorizing the use of frequencies below 10 kHz ~~for special-national-purposes~~ shall ensure that no harmful interference is caused thereby to the services to which the bands above 10 kHz are allocated.

Reason: To generalise the applicability of the above paragraph, considering possible allocations below 10 kHz.

Section IV. Tests

ADD 701A (2A) It is recognized that in some cases, in the aeronautical safety service, it is undesirable to transmit identification while making emissions for tests, adjustments or experiments. However, these transmissions should be kept to a minimum.

Reason: In the Aeronautical Service, test emissions carry no identification, per ICAO recommendations. The absence of identification is recognized as a test signal by pilots, etc.



ARTICLE 15

Procedure in a Case of Harmful Interference

MOD 710

7. Having determined the source and characteristics of the interference, the administration having jurisdiction over the transmitting station intererred with shall inform the administration having jurisdiction over the interfering station, giving all useful information in order that this administration may take such steps as may be necessary to eliminate the interference. The latter administration shall acknowledge receipt of the interference complaint immediately by telegram.

Reason

In order that the administration originating the complaint be assured that it has been received by the administration having jurisdiction over the interfering station.

ARTICLE 16

Reports of Infringements

NOC 719 through 720

MOD 721                    If an administration has information of an infringement of the Convention or Radio Regulations, committed by a station over which it ~~has-authorized~~ may exercise authority, is shall ascertain the facts, fix the responsibility and take the necessary action.

Reason                    To clarify the authority of administrations over stations committing infringements.

NOC                        ARTICLE 17

Secrecy

ARTICLE 18

Licences

NOC 725 through 730

MOD 731                    (2) For land mobile stations, including stations comprised of equipment capable of reception only, a clause shall be included in the licence, specifically or by reference, under which the operation of these stations shall be forbidden in countries other than the country which has issued the licence, except as may be provided by special agreement between the governments of the countries concerned.

Reason                    To recognize licensed radio stations capable of reception only.

# ARTICLE 19

## Identification of Stations

NOC 735 through 742

MOD 743

7.(1) All stations open to the international public correspondence service, all amateur stations, and other stations which are capable of causing harmful interference beyond the boundaries of the country ~~to~~ in which they are located or belong, shall have signs from the international series allocated to each the country which is operating the station as given in the Table of Allocation of Call Sign Series No. 747.

Reason

For clarification purposes.

ADD 743A

Administrations authorizing the operation of a station from another country within its national boundaries may specify the use of supplementary identification.

Reason

For identification of area of operation.

NOC 744 through 746

MOD 747 Table of Allocation of International Call Sign Series

Call Sign Series	Allocated to:	Call Sign Series	Allocated to:
AAA-ALZ	United States of America	EKA-EKZ	Union of Soviet Socialist Republics
AMA-AOZ	Spain	ELA-ELZ	Liberia
APA-ASZ	Pakistan	EMA-EOZ	Union of Soviet Socialist Republics
ATA-AWZ	India (Republic of)	EPA-EQZ	Iran
AXA-AXZ	Australia (Commonwealth of)	ERA-ERZ	Union of Soviet Socialist Republics
AYA-AZZ	Argentina (Republic)	ESA-ESZ	Estonia
BAA-BZZ	China	ETA-ETZ	Ethiopia
CAA-CEZ	Chile	EUA-EWZ	Belorussian Soviet Socialist Republic
CFA-CKZ	Canada	EXA-EZZ	Union of Soviet Socialist Republics
CLA-CMZ	Cuba	FAA-FZZ	France and Overseas States of the French Community and French Overseas Territories
CNA-CNZ	Morocco (Kingdom of)	GAA-GZZ	United Kingdom of Great Britain and Northern Ireland
COA-COZ	Cuba	HAA-HAZ	Hungarian People's Republic
CPA-CPZ	Bolivia		
CQA-CRZ	Portuguese Oversea Provinces		
CSA-CUZ	Portugal		
CVA-CXZ	Uruguay (Oriental Republic of)		
CYA-CZZ	Canada		
DAA-DTZ	Germany		
DUA-DZZ	Philippines (Republic of the)		
EAA-EHZ	Spain		
EIA-EJZ	Ireland		

RR19-6

Call Sign Series	Allocated to:	Call Sign Series	Allocated to:
ZRA-ZUZ	Union of South Africa and Territory of South West Africa	5RA-5VZ	France and Overseas States of the French Community and French Overseas Territories
ZVA-ZZZ	Brazil	5WA-5ZZ	(Not allocated)
2AA-2ZZ	United Kingdom of Great Britain and Northern Ireland	6AA-6BZ	United Arab Republic (Egyptian Region)
3AA-3AZ	Monaco	6CA-6CZ	United Arab Republic (Syrian Region)
3BA-3FZ	<del>Canada</del> Mauritius	6DA-6JZ	Mexico
3GA-3GZ	Chile	6KA-6NZ	Korea (Republic of)
3HA-3UZ	China	6OA-6OZ	Somaliland (Italian Administration)
3VA-3VZ	Tunisia	6PA-6SZ	Pakistan
3WA-3WZ	Viet-Nam (Republic of)	6TA-6UZ	Sudan (Republic of the)
3XA-3XZ	Guinea (Republic of)	6VA-6ZZ	(Not allocated)
3YA-3YZ	Norway	7AA-7IZ	Indonesia (Republic of)
3ZA-3ZZ	Poland (People's Republic of)	7JA-7NZ	Japan
4AA-4CZ	Mexico	7OA-7RZ	(Not allocated)
4DA-4IZ	Philippines (Republic of the)	7SA-7SZ	Sweden
4JA-4LZ	Union of Soviet Socialist Republics	7TA-7YZ	(Not allocated)
4MA-4MZ	Venezuela (Republic of)	7ZA-7ZZ	Saudi Arabia (Kingdom of)
4NA-4OZ	Yugoslavia (Federal People's Republic of)	8AA-8IZ	Indonesia (Republic of)
4PA-4SZ	Ceylon	8JA-8NZ	Japan
4TA-4TZ	Peru	8OA-8RZ	(Not allocated)
* 4UA-4UZ	United Nations (U.N.)	8SA-8SZ	Sweden
4VA-4VZ	Haiti (Republic of)	8TA-8YZ	India (Republic of)
4WA-4WZ	Yemen	8ZA-8ZZ	Saudi Arabia (Kingdom of)
4XA-4XZ	Israel (State of)	9AA-9AZ	San Marino (Republic of)
* 4YA-4YZ	International Civil Aviation Organization (ICAO)	9BA-9DZ	Iran
4ZA-4ZZ	Israel (State of)	9EA-9FZ	Ethiopia
5AA-5AZ	Libya (United Kingdom of)	9GA-9GZ	Ghana
5BA-5BZ	(Not allocated)	9HA-9JZ	(Not allocated)
5CA-5GZ	Morocco (Kingdom of)	9KA-9KZ	Kuwait
5HA-5IZ	(Not allocated)	9LA-9LZ	(Not allocated)
5JA-5KZ	Colombia (Republic of)	9MA-9MZ	Malaya (Federation of)
5LA-5MZ	Liberia	9NA-9NZ	Nepal
5NA-5OZ	(Not allocated)	9OA-9UZ	Belgian Congo and Territory of Ruanda-Urundi
5PA-5QZ	Denmark	9VA-9ZZ	(Not allocated)

Reason

Call sign series re-allocation to Mauritius.

ARTICLE 20

Service Documents

NOC 789 through 801

SUP 802 ~~(III)-List-III.-List-of-Broadcasting-Stations  
Operating-in-Bands-below-26100-kHz.~~

~~The-list-shall-be-published-in-two-volumes.~~

MOD 803 ~~a) List III A, List of Broadcasting Stations Opera-  
ting in Bands below 5950 kHz.~~

This list shall contain those broadcasting sta-  
tions the frequency assignments of which are  
shown in List I.

SUP 804 ~~b)-List-III-B.-List-of-Broadcasting-Stations-Opera-  
ting-in-Bands-between-5950-and-26100-kHz.~~

~~This-list-shall-contain-those-broadcasting-sta-  
tions-the-frequency-assignments-of-which-are  
shown-in-the-Annual-High-Frequency-Broadcasting  
Frequency-List,-published-each-year-in-accordance  
with-the-provisions-of-Section-V-of-Article-10.~~

Reason

Only list III as noted above is now published.

Sec. Gen. Circ. 214 2 February 1971 refers.

NOC 805 through 821

MOD 822 5. (1) The List of Broadcasting Stations Operating  
in Bands below 5950 kHz (List III A) shall be republished  
at intervals to be determined by the Secretary-Gener-  
al. Recapitulative supplements shall be published  
every six months.

SUP 823 ~~(2)--The-List--of-Broadcasting-Stations-Operating  
in-Bands-between-5950-and-26100-kHz-(List-III-B)  
shall-be-republished-each-year-without-supplements.~~

Reason

Consequential to 802 and 804.

NOC 824 through 837



ARTICLE 41

Amateur Stations

NOC 1560 through 1562

MOD 1563

3.(1) Any person operating the radiotelegraph apparatus of an Amateur Station shall have proved that he is able to send correctly by hand and to receive correctly by ear, tests in Morse code signals. Administration concerned ~~may~~, however, waive this requirement in the case of stations making use exclusively of frequencies above 144 MHz.

Reason

To bring this Regulation in line with RR 1570, it is considered that the obligation to impose the ~~knowledge~~ of the Morse code to all Amateurs is a national prerogative.

NOC 1564 through 1567A

NOC

ARTICLE 42

Experimental Stations

NOC

ARTICLE 43

Radiodetermination Service and Radiodetermination  
Satellite Service

APPENDICES

NOC

Appendix 6,7,8,9,10,11,12, 23.

ADDITIONAL PROPOSALS FOR ARTICLES 3,5,6,12,14,15,41,42

(Harmful interference/permissible interference)

(The basis for these revisions is explained in the Introduction to the Technical Regulations)

- ARTICLE 3     RR 113, 114, 115, 116, 117 - "harmful interference or interference in excess of the permissible, whichever is the case
- ARTICLE 5     RR 139 and 148 a)b)c) - same as Article 3
- ARTICLE 6     RR 414, 418, 421 - no change.
- ARTICLE 12    RR 675 ---elimination of harmful interference or interference in excess of the permissible, whichever is the case, employing etc.
- ARTICLE 14    RR 697 - - - causes harmful interference or interference in excess of the permissible, whichever is the case.  
RR 698, 700 -- similar to 697.  
RR 699 - no change.
- ARTICLE 15    Title needs change, i.e. Procedure in a Case of Harmful Interference or interference in excess of the Permissible!  
RR 704, 711B --- change to fit the new title.  
  
RR718 - Nos 486 or 487 and 639BA or 639BB of these Regulations.
- ARTICLE 41    RR 1567A - - - in the event that harmful interference or interference in excess of the permissible is reported.
- ARTICLE 42    RR 1575 - - - similar to 1567A.

APPENDIX I

Spa Aer

Spa<sup>2</sup>

(See Article 9)

II. Notes Concerning Information to be Entered in the Notice Pertaining to Specific Columns of the Master Register

MOD Column 1

Assigned frequency

1. Indicate the assigned frequency as defined in Article 1\*, in kHz up to 30-000 28 000 kHz inclusive, and in MHz above 30-000 28 000 kHz.
2. This information is a basic characteristic.

Reason: To correspond to the actual breakdown of the International Frequency List as currently published.

MOD Columns 9 b and 9 c

~~If the radiation characteristics of the antenna concerned differ from those recommended by the G-6-I-R,~~ In cases where an antenna with directional radiation characteristics is used the following information should be notified in Columns 9 b and 9 c:

Reason: The proposed change corresponds to the current practice.

APPENDIX 1A

Spa Spa2

Notices relating to Space Radiocommunications and  
Radio Astronomy Stations

(See Article 9A)

Section B. Basic Characteristics to be furnished  
in Notices relating to Frequencies used by Earth  
Stations for Transmitting

MOD Item 8

Power characteristics of the transmission

a) <sup>1</sup>Indicate for each carrier, the peak power supplied  
to the input of the antenna.

b) Indicate the total peak power and the maximum  
power density per Hz<sup>2</sup> supplied to the input of the  
antenna averaged over the worst 4 kHz band for car-  
riers below 15 GHz, or averaged over the 1 MHz band  
for carriers above 15 GHz.

NOC

<sup>1</sup>This information need only be furnished when such  
information has been used as a basis to effect co-  
ordination with another administration.

ADD

<sup>2</sup>The most recent version of CCIR Report should be  
used as a guide in calculating the maximum power  
density per Hz.

Reason

To standardize on a method for calculating this re-  
quired parameter. This report results from a request  
to the CCIR to develop the appropriate formula.

Section D. Basic Characteristics to be furnished  
in Notices relating to Frequencies used by Space  
Stations for Transmitting

MOD Item 9

Power characteristics of the transmission

a) <sup>1</sup>Indicate for each carrier the peak power sup-  
plied to the input of the antenna.

b) Indicate the total peak power and the maximum  
power density per Hz<sup>2</sup> at the input of the antenna  
averaged over the worst 4 kHz band for carriers be-  
low 15 GHz or averaged over the worst 1MHz band  
for carriers above 15 GHz.

NOC

<sup>1</sup>This information need only be furnished when such  
information has been used as a basis to effect co-  
ordination with another administration.

ADD <sup>2</sup> The most recent version of CCIR Report should be used as a guide in calculating the maximum power density per Hz.

Reason To standardize on a method for calculating this required parameter. This report results from a request to the CCIR to develop the appropriate formula.

---

## APPENDIX 1B

### Section C. Characteristics of the Satellite Network in the Earth-to-Space direction

MOD Item 4 Power characteristics of the transmitted wave

a) For each Earth-to-space service area, indicate the maximum spectral power density ( $W/Hz$ )<sup>1</sup> to be delivered to the antenna of the transmitting earth stations (the bandwidth over which this is averaged depends on the nature of the service concerned) and, if available, the total peak power and the necessary bandwidth of this emission.

b) If available, indicate, for each Earth-to-space service area, the actual radiation pattern (relative to isotropic) of the transmitting earth station antenna having the highest off beam equivalent isotropically radiated spectral power density.

ADD <sup>1</sup> The most recent version of CCIR Report should be used as a guide in calculating the maximum spectral power density.

---

Reasons The new footnote will assist in standardizing the methods of calculating the spectral power density.

The addition of the total peak power and the bandwidth of the emission associated with the maximum spectral power density will assist in calculation of interference potential.

Note: The use of the term "total peak power" may be revised throughout Appendix 1A and 1B to reduce the confusion caused by trying to use one term for all methods of modulation.



NOC      Section D   Characteristics of the Satellite Network in the  
Space-to-Earth Direction

NOC Item 1 - Item 3

## MOD Item 4

### Power characteristics of the transmission

For each space-to-Earth service area, 1 indicate the maximum spectral power density (W/Hz) to be delivered to the transmitting antenna of the space station (band bandwidth over which this is averaged depends on the nature of the service concerned) and, if available, the total peak power and the necessary bandwidth of this emission.

ADD

The most recent version of CCIR Report should be used as a guide in calculating the maximum spectral power density.

## Reasons

The new footnote will assist in standardizing the methods of calculating the spectral power density.

The addition of the total peak power and the bandwidth of the emission associated with the maximum spectral power density will assist in calculation of interference potential.

**Note:**

The use of the term "total peak power" may be revised throughout Appendix 1A and 1B to reduce the confusion caused by trying to use one term for all methods of modulation.

### APPENDIX 3

Mar Mar2

### Table of Frequency Tolerances\*

(See Article 12)

1. Frequency tolerance is defined in Article 1 and is expressed in parts in  $10^6$  or, in some cases, in hertz Hz.
2. The power shown for the various categories of stations is the mean power as defined in Article 1.

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* <u>1987</u> to transmitters in use and to those to be installed before 1st January, 1964 <u>1983</u>	Tolerances applicable to new transmitters installed after 1st January, 1964 <u>1983</u> and to all transmitters after 1st January, 1966* <u>1987</u>
	*1st January, - 1970 - in the case of all tolerances marked with an asterisk.	
Band: 10 to 535 kHz		
1. Fixed Stations:		
- 10 to 50 kHz	1 000	1 000 <u>100</u>
- 50 to 535 kHz	200	200 <u>50</u>
2. Land Stations:		
a) Coast Stations:		
- power 200 W or less	500 <u>1)</u>	500 <u>20 Hz 1)</u>
- power above 200 W	200 <u>1)</u>	200 <u>20 Hz 1)</u>
b) Aeronautical Stations	200 <u>100*</u>	100*- <u>50</u>
3. Mobile Stations:		
a) Ship Stations	1 000 <u>k)</u>	1 000 <u>100</u> k)
b) Ship's Emergency Transmitters	5 000	5 000 <u>100</u>

\*Certain services may need tighter tolerances for technical and operational reasons.

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* <u>1987</u> to transmitters in use and to those to be installed before 1st January, 1964 <u>1983</u>	Tolerances applicable to new transmitters installed after 1st January, 1964 <u>1983</u> and to all transmitters after 1st January, 1966* <u>1987</u>
*1st January, - 1970 in the case of all tolerances marked with an asterisk.		
c) Survival Craft Stations	5 000	5 000 <u>100</u>
d) Aircraft Stations	500	500 <u>50</u>
4. Radiodetermination Stations	200 <u>100*</u>	100*
5. Broadcasting Stations	20 <u>10 Hz</u>	<u>10 Hz</u>
Band: 535 to 1 605 kHz Broadcasting Stations	20 <u>1.0 Hz</u> b)	10 Hz b)
Band: 1605 to 4 000 kHz		
1. Fixed Stations:		
- power 200 W or less	100	100
- power above 200 W	50	50
2. Land Stations		
- power 200 W or less	100h) 1)	100 <u>30</u> h) 1) s) r)
- power above 200 W	50h) 1)	50 <u>10</u> h) 1) s) r)
3. Mobile Stations		
a) Ship Stations	200 <u>i) k)</u>	200 <u>40 Hz</u> s) k)
b) Survival Craft Stations	<u>300</u>	300 <u>100s)</u>
b A) Emergency Position- Indicating Radiobeacons	<u>300</u>	300 <u>100</u>
c) Aircraft Stations	200 <u>100*</u>	100 <u>r)</u>
d) Land Mobile Stations	200	200 <u>40 Hz</u>

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* <u>1987</u> to transmitters in use and to those to be installed before 1st January, 1964 <u>1983</u>	Tolerances applicable to new transmitters installed after 1st January, 1964 <u>1983</u> and to all transmitters after 1st January, 1966* <u>1987</u>
*1st-January,-1970-in-the-case-of-all-tolerances marked-with-an-asterisk,		
4. Radiodetermination Stations:		
- power 200 W or less - power above 200 W	100 50	100 <u>20</u> 50 <u>10</u>
5. Broadcasting Stations	50 <u>20</u>	20 <u>10</u> Hz
Band: 4 to 29.7 MHz		
1. Fixed Stations:		
- power 500 W or less - power above 500 W	100 <u>50</u> 30 <u>15</u>	50 <u>30</u> s) 15 <u>10</u> s)
2. Land Stations:		
a) Coast Stations:		
- power 500 W or less - power above 500 W and less than or equal to 5 kW - power above 5 kW	50 <u>h)</u> <u>1)</u>  50*- <u>30</u> <u>h)</u> <u>1)</u> 50 <u>15</u> <u>h)</u> <u>1)</u>	50 <u>20</u> Hz <u>h)</u> <u>1)</u>  30* <u>20</u> Hz <u>h)</u> <u>1)</u> 15 <u>20</u> Hz <u>h)</u> <u>1)</u>
b) Aeronautical Stations:		
- power 500 W or less - power above 500 W	100 50	100 <u>r)</u> 50 <u>r)</u>
c) Base Stations:		
- power 500 W or less - power above 500 W	100 50	100 <u>30</u> s) 50 <u>10</u> s)
3. Mobile Stations:		
a) Ship Stations		
1) Class A1 emissions	200 <u>50</u> p) q)	50 <u>10</u> p) q)
2) Emissions other than A1	50 <u>1)</u> <u>k)</u>	50 <u>40</u> Hz <u>i)</u> <u>k)</u>

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* <u>1987</u> to transmitters in use and to those to be installed before 1st January, 1964 <u>1983</u>	Tolerances applicable to new transmitters installed after 1st January, 1964 <u>1983</u> and to all transmitters after 1st January, 1966* <u>1987</u>
*1st January, 1970 in the case of all tolerances marked with an asterisk.		
<del>power 50 W or less</del> - - <del>power above 50 W</del>  b) Survival Craft Stations c) Aircraft Stations d) Land Mobile Stations 4. Broadcasting Stations	<del>50 c)</del> <del>50</del>  200 200 <u>100*</u> 200 30 <u>15</u>	50 c) r) k) 50 r) k)  200 <u>50</u> s) 100* <u>r)</u> 200 <u>40</u> Hz <del>15</del> <u>2</u>
Band: 29.7 to 100 MHz  1. Fixed Stations: - power 200 W or less - power above 200 W  2. Land Stations: - power 15 W or less - power above 15 W  3. Mobile Stations: - power 5 W or less - power above 5 W  4. Radiodetermination Stations	200 <u>50*</u> 200 <u>30</u>  200 <u>50</u> 200 <u>20</u>  200 <u>100</u> 200 <u>50</u>  200	50* <u>30</u> 30 <u>20</u>  50 <u>300</u> 20  100 <u>50</u> 50 <u>20</u>  200 <u>50</u>



Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* 1987 to transmitters in use and to those to be installed before 1st January, 1964 1983	Tolerances applicable to new transmitters installed after 1st January, 1964 1983 and to all transmitters after 1st January, 1966* 1987
<del>*1st January, 1970 in the case of all tolerances marked with an asterisk.</del>		
5. Broadcasting Stations (other than television):	50 30 20	50 1000 Hz 20 1000 Hz
6. Broadcasting Stations (television sound and vision):	100 30 1000 Hz	100 2000 Hz 1000 Hz
Band: 100 to 470 MHz		
1. Fixed Stations:		
- power 50 W or less - power above 50 W	±100 50 ±100 20	50* 20 20* 10
2. Land Stations:		
a) Coast Stations b) Aeronautical Stations c) Base Stations:	±100 20 n) ±100 50	20 n) 10 50 20
- power 5 W or less - power above 5 W	±100 50 ±100 20	50 30 20 10
3. Mobile Stations:		
a) Ship Stations and Survival Craft Stations: - in the band 156-174 MHz - outside the band 156-174 MHz	±100 20 n) ±100 50 d) o)	20 n) 10 50 20 d) o)

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* 1987 to transmitters in use and to those to be installed before 1st January, 1964 1983	Tolerances applicable to new transmitters installed after 1st January, 1964 1983 and to all transmitters after 1st January 1966* 1987
	- *1st January, - 1970 - in the case of all tolerances marked with an asterisk.	
b) Aircraft Stations  c) Land Mobile Stations:  - power 5 W or less - power above 5 W  4. Radiodetermination Stations  5. Broadcasting Stations (other than television)  6. Broadcasting Stations (television sound and vision):  - power 100 W or less - power above 100 W	100 <u>50</u>           100 <u>50</u> 100 <u>20</u>  200* <u>50</u> d) e)  30 <u>20</u>    30 <u>100</u> 30 <u>1000 Hz</u>	50           50 <u>30</u> 20 <u>10</u>  50* <u>20</u> d) e)  20 <u>1000 Hz</u>    100 1000 Hz
Band: 470 to 2 450 MHz  1. Fixed Stations:  - power 100 W or less - power above 100 W  2. Land Stations  3. Mobile Stations  4. Radiodetermination Stations  5. Broadcasting Stations (other than television)	7500 <u>300 f)</u> 7500 <u>100 g)</u>  7500 <u>300</u>  7500 <u>300</u>  7500 <u>500e)</u>  7500 <u>100</u>	300 <u>100 f)</u> 100 <u>50 g)</u>  300 <u>100</u>  300 <u>100</u>  500 <u>400 e)</u>  100 <u>20</u>

Frequency Bands (lower limit exclusive, upper limit inclusive) and Categories of Stations	Tolerances applicable until 1st January, 1966* <u>1987</u> to transmitters in use and to those to be installed before 1st January, 1964 <u>1983</u>	Tolerances applicable to new transmitters installed after 1st January, 1964 <u>1983</u> and to all transmitters after 1st January, 1966* <u>1987</u>
6. Broadcasting Stations (television, sound and vision) in the band 470-960 MHz  - power 100 W or less - power above 100 W	7500 <u>100</u> 7500 <u>1000</u> Hz	100 1000 Hz
Band 2 450 to 10 500 MHz		
1. Fixed Stations:		
- power 100 W or less - power above 100 W	7500 <u>300 f)</u> 7500 <u>100 g)</u>	300 <u>30 f)</u> 100 <u>10 g)</u>
2. Land Stations	7500 <u>300</u>	300 <u>30</u>
3. Mobile Stations	7500 <u>300</u>	300 <u>30</u>
4. Radiodetermination Stations	7500 <u>2000 e)</u>	2-000 <u>800 e)</u>
Band: 10.5 to 40 GHz		
1. Fixed Stations	<u>500</u>	500 <u>50</u>
2. Radiodetermination Stations	<u>7 500 e)</u>	7-500 <u>2500 e)</u>

Notes referring to Table of Frequency Tolerances

- a) SUP
- b) In the area covered by the North American Regional Broadcasting Agreement (NARBA) the tolerance of 20 Hz may continue to be applied.
- c) SUP
- d) This tolerance is not applicable to survival craft stations operating on the frequency 243 MHz.
- e) Where specific frequencies are not assigned to radar stations, the bandwidth occupied by the emissions of such stations shall be maintained wholly within the band allocated to the service and the indicated tolerance does not apply.
- f) For transmitters using time division multiplex the tolerance of 300 may be increased to 500.
- g) This tolerance applies only to such emissions for which the necessary bandwidth does not exceed 3 000 kHz; for larger bandwidth emissions a tolerance of 300 applies.
- h) For coast station single sideband radiotelephone transmitters the tolerance is 20 Hz.
- i) For ship station single sideband radiotelephone transmitters the tolerance is:
- 1) in the band 1 605–4 000 kHz:  
100 Hz for transmitters in use or to be installed before 1 January 1982;  
50 Hz for transmitters installed after 1 January 1982;
  - 2) in the band 4 000–23 000 kHz:  
100 Hz for transmitters in use or to be installed before 1 January 1978;  
50 Hz for transmitters installed after 1 January 1978.
- (See also Appendix 17A).
- j) SUP
- k) For ship station transmitters used for direct printing telegraphy or for data transmissions, the tolerance is 40 Hz. This tolerance is applicable to equipment installed after 1 January 1976 and to all equipment after 1 January 1985. For equipment installed before 2 January 1976 the tolerance is 100 Hz (with a maximum deviation of 40 Hz for short periods of the order of 15 minutes).
- l) For coast station transmitters used for direct printing telegraphy and for data transmission the tolerance is 15 Hz. This tolerance is applicable to equipment installed after 1 January 1976 and to all equipment after 1 January 1985. For equipment installed before 2 January 1976 the tolerance is 40 Hz.
- m) SUP
- n) For coast and ship station transmitters in the band 156–174 MHz put into service after 1 January 1973 a tolerance of 10 parts in  $10^6$  shall apply. This tolerance is applicable to all transmitters, including survival craft stations, after 1 January 1983.
- o) For transmitters used by on-board communication stations a tolerance of 5 parts in  $10^6$  shall apply.
- p) Applicable from 1 June 1977. However, in the A1 Morse working frequency bands a frequency tolerance of 200 parts in  $10^6$  may be applicable to existing transmitters after 1 June 1977, provided that the emissions are contained within the band in question.
- q) In the A1 Morse calling frequency bands frequency tolerances of 40 parts in  $10^6$  in the bands between 4 and 23 MHz and of 30 parts in  $10^6$  in the 25 MHz band are recommended as far as possible.

r) For single sideband transmitters operating in the  
Aeronautical Mobile (R) Service, the tolerance is:

1) In the band 1605 - 4000 kHz  
Aeronautical Stations 10 Hz  
Aircraft Stations 20 Hz

2) In the band 4 - 29.7 MHz  
Aeronautical Stations 10 Hz  
Aircraft Stations 20 Hz

s) For A3A, A3J, A3H, A7J emissions where applicable  
the tolerance is 40 Hz.

REASON: To systematically tighten the specification in line with existing and planned usage. For example, where it is proposed that D8B be phased out, the appropriate stability is prescribed. Systematic tightening of these specifications will allow higher quality international reception, make interference rejection more easily, and in many cases, increases possibility for channel-spacing reduction.

NOTES: (1) The values chosen will not cause any hardship in Canada during the time period indicated.

(2) The Table may need additional footnotes to accommodate Meteorological Aids, now under consideration by National Branch and MOT.



APPENDIX 4

Table of Tolerances for the Levels  
of Spurious Emissions  
(see Article 12)

SUP

~~5. The final date by which all equipment shall meet the tolerances specified in Column B is 1st January, 1970. Nevertheless, all administrations recognize the urgent need to implement Column B tolerances for all equipment at the earliest possible dates and will endeavour to ensure that necessary changes are made to all transmitters under their jurisdiction well before this date and wherever possible by 1st January, 1966.~~

MOD

~~5. -6.~~ No tolerance is specified for transmitters operating on fundamental frequencies above ~~225~~ 960 MHz. For these transmitters the levels of spurious emissions shall be as low as practicable.

Reason:

Consequential to changes in Table.

- 215 -  
APPENDIX 4

Fundamental Frequency Band	The mean power of any spurious emission supplied to the antenna transmission line shall not exceed the values specified as tolerances in Columns A and B below	
	A	B
	Tolerances applicable until 1st January, <del>1970</del> 1987 to transmitters now in use and to those installed before 1st January, <del>1964</del> 1983	Tolerances applicable to new transmitters installed after 1st January, <del>1964</del> 1983 and to all transmitters after 1st January <del>1970</del> 1987
Below 30 MHz	40 decibels below the mean power of the fundamental without exceeding the power of <del>200</del> 50 milli-watts <sup>1,2,3</sup>	40 <del>60</del> decibels below the mean power of the fundamental without exceeding the power of <del>50</del> 25 milli-watts <sup>1,2,3</sup>
30 MHz to 235 MHz: for transmitters having mean power: - greater than 25 watts  - 25 watts or less	60 decibels below the mean power of the fundamental without exceeding 1 milli-watt <sup>4</sup>  40 decibels below the mean power of the fundamental without exceeding 25 microwatts and without the necessity for reducing the value below 10 microwatts <sup>4</sup>	60 decibels below the mean power of the fundamental without exceeding <del>1-milli-watt</del> 50 micro-watts <sup>5</sup>  40 <del>60</del> decibels below the mean power of the fundamental. <del>without exceeding 25-microwatts and without the necessity for reducing this value below 10-microwatts</del> <sup>4</sup>
<u>235-960 MHz</u> for <u>transmitters having mean power:</u> - <u>greater than 25 watts</u>  - <u>25 watts or less</u>		60 decibels below the mean power of the fundamental without exceeding 50 microwatts <sup>5,6,7,8</sup>  60 decibels below the mean power of the fundamental.

- MOD 1 For transmitters of mean power exceeding 25 kilowatts and which operate below 30 MHz over a frequency range approaching an octave or more, ~~a reduction below 50 milliwatts is not mandatory;~~ but a minimum attenuation of 60 decibels shall be provided and every effort should be made to keep within the 50 25 milliwatts limit.
- MOD 2 For hand-portable equipment of mean power less than .5 watts which operates in the frequency band below 30 MHz, the attenuation shall be at least 30 decibels, but every effort should be made to attain 40 60 decibels attenuation.
- MOD 3 For mobile transmitters which operate below 30 MHz any spurious emission shall be at least 40 60 decibels below the fundamental without exceeding the value of 200 50 milliwatts, but every effort should be made to keep within the 50 25 milliwatts limit wherever practicable.
- NOC 4 For frequency modulated maritime mobile radio-telephone equipment which operates above 30 MHz, the mean power of any spurious emission falling in any other international maritime mobile channel, due to products of modulation, shall not exceed a limit of 10 microwatts and the mean power of any other spurious emission on any discrete frequency within the international maritime mobile band shall not exceed a limit of 2.5 microwatts. Where, exceptionally, transmitters of mean power above 20 watts are employed, these limits may be increased in proportion to the mean power of the transmitter.
- ADD 5 For broadcasting transmitters the absolute limit of 50 microwatts may not be achievable. However, the 60 dB criteria must be met.
- ADD 6 For radiodetermination stations, the lowest practicable level of spurious radiation shall be achieved.
- ADD 7 For survival stations operating at a frequency of 243 MHz, the lowest level of spurious radiation, consistent with the type of apparatus, should be achieved.
- ADD 8. Since the limits mentioned above may not provide adequate protection for receiving stations in the radio astronomy and space services, lower limits might be considered in each individual case in the light of the geographical position of the stations concerned.

- Reason:
- (1) To promote a systematic tightening of the specifications
  - (2) The values are derived from examination of DOC Radio Standard Specifications as well as practical knowledge of present and future equipment. Also, reference was made to CCIR Recommendation 329-2.
  - (3) The footnote 5 is added because it is felt that achieving higher than 60 dB is not cost effective in the TV broadcast service.
  - (4) Footnotes 6,7,8 are taken from CCIR Recommendation 329-2.
  - (5) Data beyond 960 MHz is not available.

Note: Comments are requested on the possibility of extending the table of Tolerances beyond 960 MHz.

NOC

## APPENDIX 8

## APPENDIX 9

Service Documents

SUP List III B. List of Broadcasting Stations Operating in Bands  
between 5 950 and 26 100 kHz

Reason: Information for this list was obtained from annual High Frequency Broadcasting List which was discontinued in 1971. (List IIIB on hand dated 1967).















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